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April

WONDER Stories

HUGO GERNSBACK
Editor

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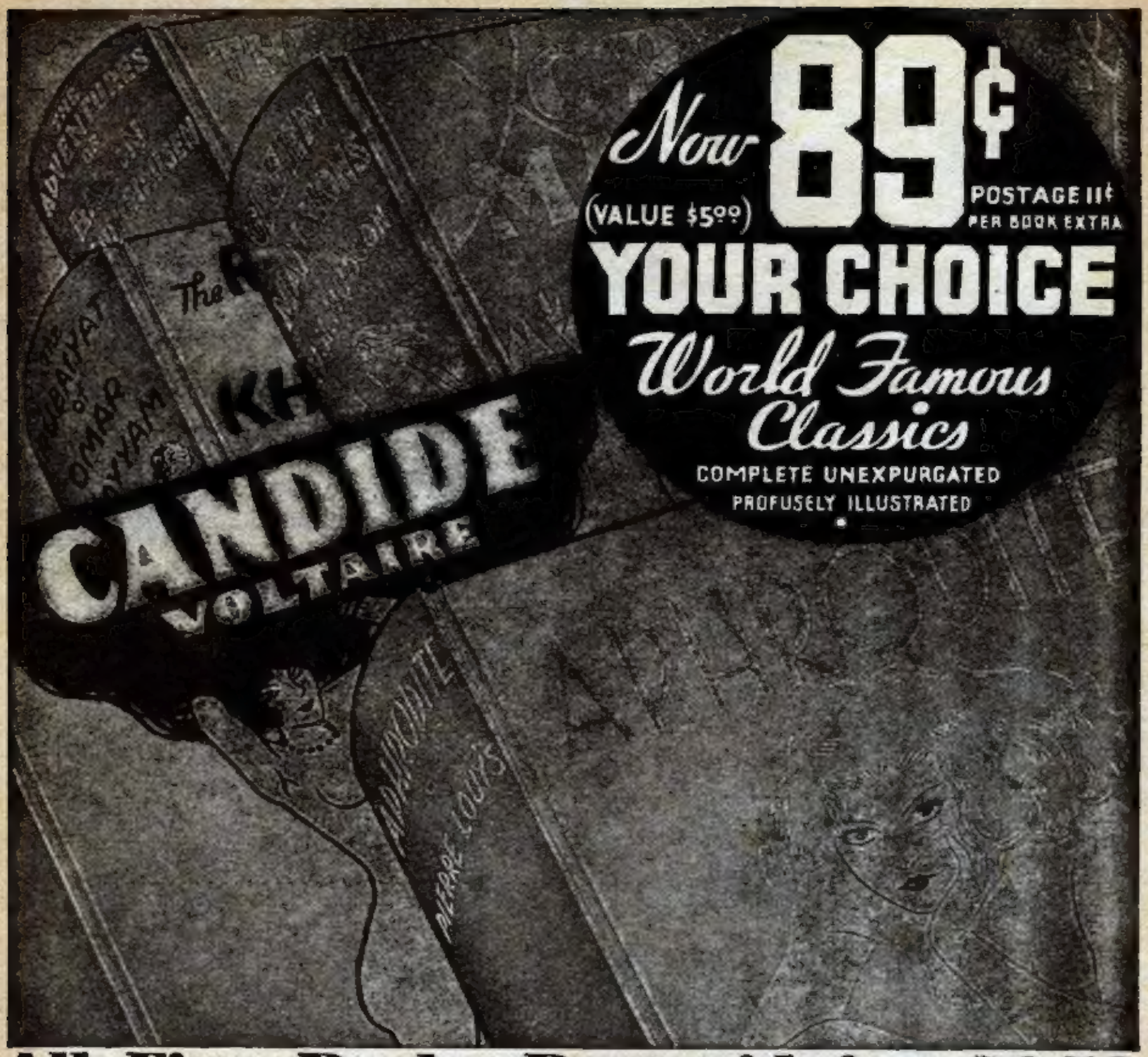

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The Magazine of Prophetic Fiction

WONDER Stories

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ON THE COVER THIS MONTH

taken from Arthur G. Stangland's "Fatal Equation" we see the mathematician Macmillan escaping from his accusers by stepping into the time vortex. Almost instantly he vanishes.

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EDITORIAL PAGE

APRIL, 1933

Volume 4 Number 11

WONDER Stories

HUGO GERNSBACK
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WONDERS OF INTERPLANETARY LIFE

An Editorial by Hugo Gernsback

● The recent announcement by scientists, that life in bacterial form has been discovered in meteorites which have struck the earth, caused a great deal of excitement in scientific circles. The discoverer himself, however, is not sure that the tests in connection with the experiments were adequate.

The idea, moreover is not new. Over twenty years ago, the Swedish scientist, Svante Arrhenius, suggested that life-bearing spores are probably floating through the entire universe in a sort of suspended animation and, if they fall on the right celestial body, they will again come to life.

Experimentally, it has been found that extreme colds do not kill bacteria. Indeed, very recent experiments show that bacteria chilled to —269° centigrade in liquid helium survived this test and were not harmed thereby. This would seem to prove that these microscopic bacteria, adhering to bits of rock or meteoric iron, might come to life when they fall upon the earth. All this is within the bounds of scientific possibility today, although it is most difficult to prove. The reason is, first, that experiments conducted with airplanes and balloons flying through the stratosphere collected bacteria as far up as they could go. Whether these bacteria or spores are driven by the wind upwards and then settle upon our testing balloons, or whether they come from space it is impossible to state at present. It is the old story which came first, the hen or the egg. So, when meteorites are examined after they have fallen on the earth, we have no positive knowledge that whatever life is on the meteorite did not come from our own planet originally.

On the other hand, it may well be that for countless ages, the earth has pollinated practically our entire solar system with life. We know that life-giving spores are whirled to great heights above the surface of the earth by storms, and once they get some hundred miles up, they then fly unhindered into free space where they then become subject, in a small way, to the gravitational attraction of the sun and other bodies. It is conceivable, as Svante Arrhenius pointed out, the pressure of light may even drive these spores outward, away from our own solar system. Given sufficient time, life may therefore appear in some other universe after countless ages—always providing that conditions in the other universe are favorable to life.

It is extremely silly to think that the earth is the only world favored for life as we know it in all the universes. Nature does not work that way. In every other endeavor, nature is most lavish, particularly when it comes to life. Fish, for instance, lay millions upon millions of eggs, from which only a comparatively few fish hatch and survive. It is the same throughout the living cosmos. The law of averages precludes the possibility that the earth is the only life-bearing world. The chances are overwhelming that there are millions of other worlds where the conditions for life, as we know it, are right and where living organisms have been produced.

And while evolution may have produced all of the millions of varieties of life which we find on this planet, the chances are that some of the species had their origin not on this earth at all, but came originally from out of space.

When I refer to life, I, of course, do not necessarily refer to the animal kingdom alone. Plants are forms of life also; and we know today, that there is a transition between plant life and animal life. There are certain forms which are neither animal nor plant. The coral and sponges are in this variety, and it is, of course, easier for life-giving plant spores to be transported through space for countless ages than bacteria because the plant spores probably would survive the extreme cold and other hazards longer and better than the bacteria.

What effect cosmic rays and ultra-violet rays have on these migratory life-bearing spores we do not as yet know. The chances are, however, that they are important factors in keeping the spores alive.

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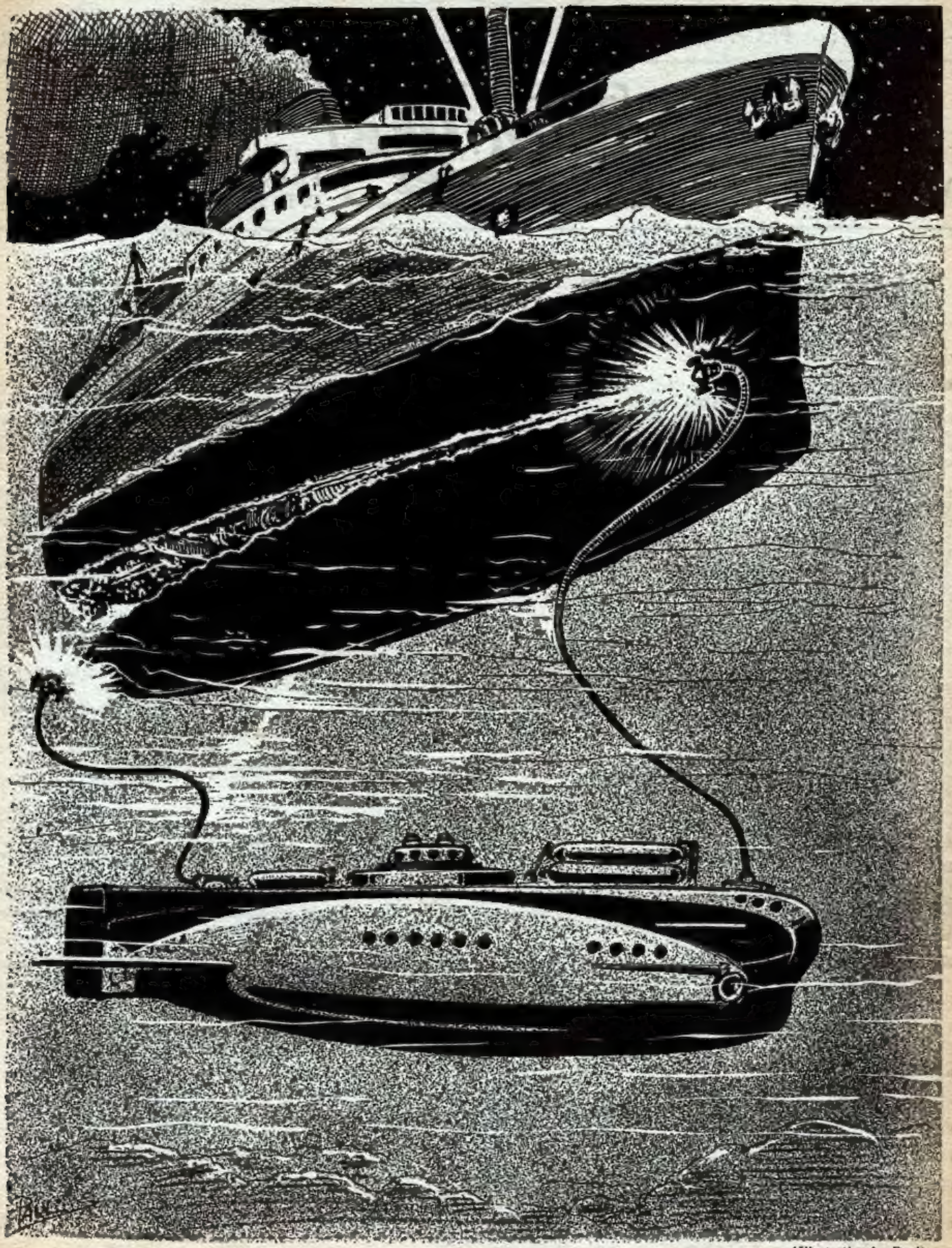


(Illustration by Paul)

"They went through the sheathing of the hull like butter. Just as we cast off the whole bottom of the boat dropped sizzling. We had to dive fast to miss being crushed."

REVOLT OF THE SCIENTISTS

By NATHAN SCHACHNER

● Albert Einstein recently called upon the world's twenty-five best minds to organize to settle some of the world's problems. Technocracy hints that technicians should take over the operation of all industries. Do these significant statements mean that science is now emancipating itself from the domination of business men and militarists? At the moment we do not know. But we do know that men of science are becoming increasingly dissatisfied with the use made of their intellectual output.

Certainly therefore a time may come when scientists will be forced to break away entirely from law and order and try, as Mr. Schachner shows in this marvelous story, to create by illegal means a new world, "nearer to their heart's desire."

● Cornelius Van Wyck yawned, shook his tousled blond hair, and struggled to an upright position. Carter, his very English personal man, was standing patiently before the bed, a silver tray in his hands, uttering discreet coughs at stated intervals.

"Eh, it's you, Carter!" his sleepily indignant master exclaimed. "Go 'way. My head! What a party!" He gently sank back into the pillows.

"Yes, sir," Carter said imperturbably, showing no signs of retreating. "Your breakfast, sir—and it's noon, sir."

"Eh, what's that? The young man bolted upright again, sleep banished from consternation-filled eyes. "I've a blankety date to speak at the Explorers' Club Luncheon at twelve-thirty sharp."

"I have taken the liberty to engage a taxicab for you, sir. The driver is waiting down in the lobby."

"Good old Carter!" Van Wyck approved, his mouth full of buttered toast and hasty gulps of steaming coffee.

Carter coughed delicately. His master looked up sharply; he knew that cough.

"Out with it; get it off your chest. I've got to be out of here in three shakes of a lamb's tail."

"Hardly worth troubling you about, sir," the man deprecated, and at the same time lifted a tabloid newspaper by a corner as though it were a loathsome snake for Van Wyck to view. "It's this thing, sir. I thought you might be interested."

Cornelius stared at the violent front page of the *Daily Tabloid* and promptly choked upon a particularly enormous piece of toast.

His own rather smudged visage grinned back at him in half page display, encased in screaming twenty-four-point headlines:

"MILLIONAIRE SPORTSMAN DEFIES RACKETEERS! PLEDGES MILLIONS TO WAR ON LIQUOR COMBINE."

And in slightly smaller type:

"Cornelius Van Wyck, internationally known polo player and leader of the successful Mt. Everest Expedition, when interviewed by our reporter at the Byrd reception in honor of his homecoming, professed himself shocked at the conditions existing in the United States. He declared that—"

The lion of the Byrd reception dashed the picture-newssheet violently to the floor, and groaned.

"Damn! I might have known the fellow was a reporter. It's evident, Carter, that I can't stand bathtub gin any more."

"Yes, sir."

"And further, old thing," the young man developed his grievance heatedly, "I've been made to look a perfect fool. The whole country'll be laughing at me this morning with their breakfast cereal."

"Yes, sir."

Van Wyck looked at the man suspiciously, but his face was a graven image. Not a muscle twitched.

Then Carter coughed delicately.

"Have you given any thought, sir, to the possibility that the gentry described as 'racketeers' may take your—er—vinous remarks with an undue amount of seriousness?"

Cornelius stared long at his man, then his rueful face brightened perceptibly.

"Come now, Carter, do you really think it possible?" There was an ungodly amount of hopefulness in the question.

Before the butler could reply, there was a tinkling sound from the lobby phone. Carter lifted the instrument and said: "Mr. Van Wyck's apartment."

Cornelius dangled a slippered foot against the side of the bed and stared out of the French window at the roofs of Manhattan and the green of Gramercy Park far below.

● Carter turned from the receiver: "A gentleman to see you, sir. Answers to the name of Peter Dribble."

"More of those damned reporters," said his master violently. "Tell switchboard to send him away. I'm not at home; won't be for the next year and a half."

"He says he has a letter addressed to you from a chap named Adam Roode."

Van Wyck paused in the act of pulling on a sock.

"Adam Roode!" There was astonishment in his voice. "Tell him to come up, by all means."

"Might it not be a trap, sir?" Carter suggested. "This Adam Roode—"

The young millionaire laughed. "You *are* an insular

blighter, old bean. Every one else in the world has heard of Roode. The world's greatest scientist in atomic physics. Winner of the Nobel Award and all that. Met him once or twice when dear old Princeton inveigled a fat endowment out of me for a Chair in Physics to be filled by him. Quit it cold two years ago to head the Research Department of General Power Company at Schenectady. I wonder what he wants from me now? Money for some fool idea, I suppose."

Van Wyck was fully dressed by the time the visitor was ushered in, all thought of the luncheon appointment driven from his mind. Peter Dribble proved to be a tall young man with a frank smile and a cordial handshake.

"I'm Roode's research assistant," he said. "The note no doubt is self-explanatory. I know nothing at all about it."

Cornelius wondered a bit at the man's haste in warding off questions as he ran his finger under the sealed flap, ripped it open and extracted a sheet of notepaper bearing Roode's monogram.

There were just a few lines in strong, angular handwriting.

"My dear Van Wyck," it read, "it is of the utmost consequence that I see you at once. For reasons which will be apparent at our meeting, it is impossible for me to come to you. You will therefore follow the bearer, Peter Dribble. Ask no questions. Speed and secrecy are vital."

The last sentence was heavily underscored, and the signature that followed was authentic. Van Wyck had seen examples of it in the formal correspondence relating to the endowment.

For a moment the young millionaire was staggered and what's more, a bit resentful. The abrupt imperatives of the note, the utter lack of explanation, the calm assurance that he would drop everything and come—was the man mad?

"What the devil does this rigamarole mean?" he exploded to the waiting young man.

"You may remember I warned you I know nothing—nothing at all," that worthy stated pointedly. Then his face sobered. "It's important, damnably important. You know old Roode. Trust him—and me."

Van Wyck hesitated, thought of his awaited speech at the Explorers' Club, and a refusal trembled on his lips. Then suddenly the mystery of the affair, Roode's undoubted prominence, the lure of beckoning adventure that had led him to the four corners of the earth, brought impulsive utterance.

"I'll come. Half a minute."

For the first time in a normally glacial existence, Carter stammered as he helped his young master into his expensive topcoat and handed him his gloves. "B-b-but, sir, you don't know this gentleman. How do you know—?"

Cornelius slipped a small but deadly automatic into his pocket and was already halfway to the door.

"Let's go, Dribble." To Carter: "Keep the diggings warm against my return." And he was gone, young Dribble treading on his heels, leaving a very much dismayed English butler gaping vacantly at a slammed door.

They emerged from the ornate lobby into the street. Dribble gripped him by the arm and steered him across to the park side where a small speedy sedan of excellent make was parked. Half a block down, fronting them, the noise of a self-starter emanated from a long lean touring car, whose sides were completely enswathed in curtains.

Dribble broke into a sudden run, dragging the startled young man by the arm. He wrenched the door of the sedan violently open, shoved Cornelius half-sprawling into the interior, jumped headlong into the driver's seat, slammed the door, stepped on the starter, and meshed into gear, all almost in one flowing motion.

Behind, the touring car was roaring into swift acceleration.

"What the hell!" Cornelius ejaculated, twisting half around to his companion. "If this is a plant, young fellow—" In spite of a slithering turn round a sharp corner, the gun muzzle in his hand was steady—.

● Dribble twisted into Third Avenue on two wheels and narrowly missed a coal truck.

"They're after us!" he yelled. "They've gotten wind of us somehow."

Van Wyck glanced back as Dribble squirmed in and out of traffic and elevated pillars. The touring car was two blocks behind. A spurt of orange flame stabbed forward. A light sedan swerved suddenly out of their path, crashed crumpling into an iron pillar. Cops' whistles shrilled. Then Dribble shot deftly into Twenty-Sixth Street, went north on Second Avenue. The touring car was nowhere to be seen.

Van Wyck took a long breath, his eyes dancing.

"For a scientist, Dribble," he spoke admiringly, "you're rather a competent hand. But why did those birds try to wash us out; were they after you or me?"

"Both," Dribble answered laconically, and settled down to fast, steady driving. In the Seventies he turned east again. At the end of the street there was a ruinous abandoned dock; beyond it the East River flowed dark and sullen.

He steered wide and turned sharply to the right, up a runway onto the sidewalk. An old abandoned brewery loomed forbiddingly above them, its dark brick grimed with age, every window nailed up with rotting boards; ruinous, like the dock, the river on which it fronted. Though the Prohibition Amendment had been repealed two years already—since 1935, to be exact—this particular rickety structure had never been restored to its former use.

Van Wyck glanced sharply at his companion, hand gripping the gun in the depths of his coat pocket. He didn't like the looks of things.

The car had barely slowed into second when the great doors of the brewery, once wide-spreading for the resounding hoofs of powerful Percherons and the banging wheels of barrel-filled wagons, slid silently open.

It was dark inside, pitch black. The car lurched forward. Van Wyck cried out sharply, pressed his gun against the driver's side. He was sure now it was a plant. But the great doors had slid close behind them, and the place sprang suddenly into soft illumination.

Dribble was grinning. "You might as well put your gun away," he said. "I'm harmless; and Roode is waiting for you."

The young millionaire glanced warily around. To his surprise they seemed to be in a garage, a small, walled-in garage at that, housing four other cars of varying makes, and one huge enclosed Mack truck.

Van Wyck, acting always on instinct, suddenly dropped his gun back into his pocket.

"I'm trusting you," he said simply.

Dribble made no comment but switched off the ignition and opened the door of the sedan. Van Wyck followed him out silently. At the blank inner wall Dribble pressed his thumb against a tiny crack. A violet light enveloped them both.

"Photo-electric cell," the scientist explained. "It's transmitting our picture to the other side of the wall so they can check up on us."

Van Wyck was dumbfounded. What was it all about any way? But he only said: "And if we're not the right people?"

"That wall can be charged electrically with fifty thousand volts."

"Good Lord!"

But evidently the inspection was satisfactory, for the solid seeming wall slid back into a recess, and they stepped through.

Van Wyck glanced swiftly around. What a strange place Adam Roode had picked out for a meeting place. The vast interior was still redolent of forgotten beer and musty ale. The great vats of copper, the long, serpentine refrigerating pipes were still intact, and strangely enough, shining and spotless. They had been cleaned quite recently. He saw now that the entrance garage was also a recent addition, a toy inset in the great echoing space, its walls of lusterless steel.

Another new partition divided what had been offices of old from the rest of the plant. Far off in one corner, he beheld a dim maze of machinery, actively at work, judging from the intermittent sparks in the gloom and the faint hum that pervaded the place.

But he had no further time for visual investigation. A door opened in the office partition, and a man walked out toward them. The dim concealed lighting disclosed a spare angular Yankee with Roman nose, iron-gray hair and close-cropped mustache. The shrewd kindly eyes twinkled as he held out his hand.

"My judgment of you was right, then, Van Wyck." There were remnants of a nasal drawl in his voice. "I felt you couldn't resist my note."

"No more I could, Mr. Roode," Cornelius acknowledged. "But now would you please explain the meaning—"

The famous physicist held up his hand. "All in due time." Then to his assistant: "Good work, Dribble. Any trouble?"

"Plenty, sir." And the young man proceeded to tell of the touring car that had machine-gunned them.

Adam Roode turned very grave and grim. He stared thoughtfully at the distant machinery. "That means that in spite of our precautions some inkling of what we're up to has leaked out. Well, we're prepared for war; we're not afraid."

Then he smiled: "Come in, Van Wyck, I want you to meet the others."

CHAPTER II
Agreed!

● It was a very curious young man who walked into the spacious well-lit room beyond the partition with its comfortable fittings and numerous deep easy chairs. There were a dozen men seated in relaxed attitudes, and the air was hazy with pipe smoke. It reminded Cornelius of a scene in one of his own clubs.

But as the men came to their feet at his entrance, that impression was immediately dissipated. These keen looking chaps with their quick, lithe movements, intellectual faces and musicianly, competent hands bore not the faintest resemblance to the stodgy, well-fed clubmen he knew. There was a Jap among them too, as well as others of distinctly foreign features.

Roode waved his hand around all-embracingly.

"My colleagues. Cornelius Van Wyck! He's scaled Mt. Everest, flown over the North Pole, descended deeper than any other man in a submarine." His smile broadened. "He's also scandalously wealthy. Now this," he pointed to a lean sinewy man with a slight stoop, "is Stewart Peasley. He's Chief Chemist of the Du Rivière Chemical Company. He's guilty of that new explosive, *dynol*, you know."

And so on down the group. Lee Randolph, Southern and fair-haired, Chief Engineer of the far-flung American Supermetals Corporation; Jonas Harmon, puritanically grim, mining and oil expert of the Lafayette Coal and Fuel Co. There was the great English mathematician, Lord Wollaston, coolly elegant; Herbert Grace of Galilee Steel; Rudolph Chess, the German physiological psychologist with moon face and nearsighted eyes behind spectacles. Also the greatest living authority on radio-communication, Alfred Silversmith, who was indispensable to the gigantic American Radio Corporation. His dark lean face and fiery eyes betrayed his Jewish ancestry. And Dr. Meyran, surgeon, whose skill with the glittering radio-knives he had invented was positively diabolical; Lake Forrest, the submarine technician; Pat McCarthy, Rabelaisian Irishman whose gusty wit was proverbial, ranking expert of General Aviation. Then finally, bowing and smiling, Dr. Kuniyoshi, noted biologist and bacteriologist.

Van Wyck's bewilderment grew as each man acknowledged his dazed salutation with a smile and a handshake. He had heard of these men, every one of them. Who for that matter hadn't? They were headliners; the world's greatest in their respective fields. What had brought them together in such utter secrecy and in such strange surroundings? So far as he knew, neither Wollaston nor Kuniyoshi were supposed to be in the United States. And just where did he fit into this stellar aggregation?

Roode noticed his inward turmoil and said gravely: "Explanations are in order. I am a scientist; so are my colleagues. We've spent our lives in following truth, scientific truth. We've probed nature's secrets, invented, discovered, and without a thought of self, given the fruits of our researches to our employers, to mankind."

He paused a moment and his colleagues nodded slow agreement.

"I for one," Roode went on, "considered my responsibility at an end when I published my research, turned my invention over to my employers. The use or misuse of the fruit of my brain did not concern me. That was the affair of business men, manufacturers, industrialists, politicians; *my* devotion was to science, pure science."

"We all felt that way," Randolph murmured.

"That was the disgrace of it," said Roode, addressing himself to Cornelius. "It's hard to say just when my viewpoint changed. During the first years of the depression I remember feeling vaguely uncomfortable. Here we were, the scientists of the world, tapping nature's resources with accelerated pace, yet somehow, the world of men, the ordinary man in the street, did not seem to be benefiting. Grace's new defensive armor, Peasley's pow-

erful explosive *dynol*, Forrest's improved submarine, McCarthy's stratosphere planes, what are they all being used for?"

Van Wyck, intent and interested, grinned wryly.

"I know the answer to that one," he remarked. "War, more war, and lots of it. I free-lanced for China in one of those stratosphere planes not so long ago."

Roode nodded. "Exactly. Half the world is now at war, and we invented the weapons that make its tremendous destructiveness possible. Take Randolph's improved machinery, my own slight tapping of atomic power; as a result production has leaped ahead, and as a stranger result, no one has the money to buy the products of our prolific machines. Then there is the general lawlessness, the rise of rackets to a dominating position in our political and industrial life. No one seems able to cope with them. I knew something was wrong, but just couldn't put my finger on it."

Harmon interrupted. "I knew the answer," he said in dour tones. "At least the newspapers gave it to me. It was Prohibition! Repeal Prohibition and the rackets it brought in its train would disappear with it. Everybody would be prosperous; all war would cease; the golden age would come."

"I had some such idea myself," Roode acknowledged. "But then Prohibition *has* been repealed, and it doesn't seem to make much difference. The bootleg racket has become even stronger. There is more unlawful liquor being sold in the United States now than before 1935. And the men who run the racket are practically running the nation. Then one day it dawned on me."

"As it had dawned on me years ago," Silversmith said passionately. "But I was a voice crying in the wilderness."

● Roode turned to him earnestly. "Don't misunderstand me. I'm not attempting to take any credit for this. I'm just explaining the genesis of this meeting to young Van Wyck. I saw, as in a blinding light, that we, the scientists, were responsible. We blithely discovered our truths, forged our weapons, and then just as blithely turned them over to incompetents, muddleheads, greed-filled industrialists—evil, ambitious men. We gave dangerous, destructive toys to children. It is too late to recall our gifts, but we can fight fire with fire. It is our moral duty. The politicians of the world, the business men, won't help. The former are the creatures of the dominant racket combines, the latter think that the Manchurian war, the South American embroglios, are God-given outlets for their products.

"I set to work. At various scientific meetings I sounded out those I thought might be receptive to my plans. To my great surprise, Van Wyck, I found most of those I approached more than receptive; they were positively enthusiastic. The feeling of discontent had been widespread. For half a year we worked quietly, and this is the result." He smiled and waved a hand around. "I may safely say that we have a goodly portion of the world's brains within these four walls, which by the way, are the gift of a brewer friend of mine who is unable to reopen because of the liquor racket."

Van Wyck was impressed, but puzzled.

"Your aims are admirable," he pointed out. "But concretely, what can you do?"

"Fight fire with fire, as I said before," Roode retorted promptly. "There is no time for political or educational action. The world is suffering from cancerous sores, and we are surgeons who must lance them, one by one."

"You mean—"

"That our warfare with the ills of society will be entirely extra-legal. We are the spearhead of science; all its known weapons are in our arsenal. There are others too, invented by various of our men, that we have decided not to publish to the world. We shall use every resource; we shall strike hard and ruthlessly and with the utmost secrecy. That is half the battle. Perhaps by the time we are through the world will be a half decent place to live in."

His eyes burned with strange fires. Van Wyck looked slowly around the circle. In every eye, even the German's behind his spectacles, there gleamed a responsive enthusiasm, a certain grim crusading spirit.

The millionaire explorer stared at them with a strange mixture of incredulity and awe. These men of thought, of science, with slight, under-trained bodies, attempting to become men of action, trying to be hard and ruthless in a world of hard and ruthless men. Did they know what they were up against? Then suddenly: Why not? Hard clean brains have always proved a match against brute strength and muddled thinking.

"By God!" he said aloud, involuntarily, "I think you can do it!"

"We *know* we can!"

"But where do I fit in? I'm not much of a chap on science, you know."

Roode smiled. "You have other qualities; just as important in their way. That front page spread in the *Daily Tabloid* gave me the idea."

Van Wyck groaned. He regretted bitterly his bibulous expansiveness.

But Roode continued surprisingly. "It showed me you were one of us at heart. True, you mentioned only the liquor combine, but such indignation against world conditions no doubt extends to every form of injustice. We are all of us only moderately wealthy men; our resources have been taxed to the utmost for the sketchiest of preparations. We shall require literally millions. You have proffered them for war against only a minor ailment; we accept for the greater program."

Van Wyck's mouth opened, and closed again. The cool insolence of the man, disposing of his fortune like that. For a moment he felt unreasoning rage; he wanted to shout his refusal to these fanatics with their grandiose mad schemes. Don Quixotes, that's what they were, tilting against windmills! *His* money forsooth!

He started to shake his head in a decided negative when Randolph broke in: "I'm afraid Roode hasn't quite stated our program in full. Possibly he feared to prejudice you from the start, but the truth must eventually come out, and you may as well know it now. We intend to do more than fight isolated evils, right certain wrongs. That would be unworthy of clear-minded scientists. Attacking symptoms has never yet eradicated roots."

He paused a moment, and there was a deathly stillness in the room. Cornelius had an uneasy notion that it would be better for him not to hear the rest. But the fair-haired engineer went on inexorably.

"We may start on superficial sores, to try out our hand, to clear the way, but our ultimate aim is—by legal or illegal means, by downright force, if necessary, to take

over the management of the world, its industries, its mechanism, and run it as only scientists know how—for the benefit of all humanity."

Van Wyck gasped. "But that," he said, "is—"

"Technocracy!" Randolph interrupted coldly. There was an uneasy stirring in the room. The fatal word had been spoken aloud.

No one living in the years 1932 and 1933, which marked the first wide-spread public interest in that cult, could possibly have dreamt what anathema lay concealed in that innocuous word for the year 1937. The rabid war and post-war psychoses against such red rags to unreasoning hatred as *I. W. W.*, *Huns*, *Bolshevism*, *Communism*, possessed not a tithe of the intensity of the hysterics excited by the mere mention of the term, *Technocracy*.

● At first it had swept the country; the man in the street, in the ditch, on the farm, in the lumber camps, all spoke with assumed authority on the work of Howard Scott and his associates. The American public being particularly susceptible to sudden crazes, (vide the mah-jong and crossword puzzles of yesteryears), the name *Technocracy*, without clear understanding, ran through the nation like fire through dried stubble.

The depression-weary, the unemployed, lifted up their hands to it like unto a new religion. In vain did the engineers and scientists who had originated the plan exhort; they had unleashed irresistible forces. Spontaneously, all over the land, banners arose, bearing the magic word. Hordes flocked to them, started the march on Washington. Like snowballs they grew with countless accretions. The whole country seemed on the march.

Inevitably there was rioting, some looting. The troops were mustered. There were clashes, minor at first, then more and more serious. Then suddenly, there was revolution, fighting on vast scale between disciplined troops, trained to shoot on order, and fanatic-eyed multitudes, crying the shibboleth that was to bring them food for their bellies, clothes for their backs.

When it was over, the thousands of dead buried, the hordes driven into the ground, the business men, the financiers, and therefore the government, frothed at the mouth at the mere mention of the dreaded word. Heavy penalties were decreed for any one daring to espouse Technocracy, even academically. The original organization was scattered; dead, or repentant.

That is why Van Wyck, wealthy man of leisure, whose interests had not given him many contacts with the inequalities of the world, reacted conventionally to the word.

"Now I *know* you are mad," he cried.

Roode smiled strangely. "Look around at the men here. You know their achievements. Are they *all* mad? Don't adopt the opinion of an unthinking world without inquiry. The ideas of Technocracy are logical, coherent. They represent a way out of the disorder and suffering of our civilization. It is science set to cure the ills that came about through the misuse of science. We feel our competence to put them into effect, but the world will not listen. Therefore we are driven to underground methods. Let me explain in detail."

And he proceeded to overwhelm a slightly bewildered young millionaire with facts, more facts; with theories, with energy determinants, with concrete examples. Van Wyck replied with all the arguments at his command. Whereupon the others in the room took a hand.

Back and forth the discussion raged; hours of heated wrangling; faces became flushed, smoke filled the room in thick layers, men's throats were dry and parched. Steadily Van Wyck was driven from one untenable position to another, until finally, the young millionaire flung his hands outward in gesture of surrender.

"Gentlemen, you have convinced me. I see now that there are other and greater adventures than the ones I have been accustomed to. I agree—on one condition."

The room was suddenly silent.

"And that is—?"

"That I become one of your band. True, I am not a scientist; but I *am* a man of action; and something tells me that before you are through, you'll have considerable need for such a one."

Roode let his eyes travel over his colleagues. One would never have dreamed they had been arguing heatedly for hours. They were relaxed in their chairs, placidly puffing away at pipes and cigars. Each nodded casual approbation in turn.

"Agreed then!" His voice was calm.

Just as matter-of-factly Cornelius said: "Tomorrow I shall deposit to a special account in my bank the sum of five million dollars, to be drawn against by myself or by Roode. That will provide for contingencies in the event something happens to one of us in the course of our—er—operations."

"Good!" Roode commented. "We shall start at once. This will be our headquarters. Even the owner doesn't know what use I am making of it. Its location, our membership, our aims, our very existence must be kept secret. That is vital!"

"How about that little tête-à-tête Dribble and I had with our friends the machine-gunners?"

Dribble spoke up: "I've been thinking about it. They must have been after you. The liquor crowd thought you meant it."

● Van Wyck smiled slowly. "I didn't then, but I do now. Tell you what. If this place is headquarters, it'll need guarding. I'll give up my diggings, announce I'm going away for a rest, and install myself here. Carter, my man, will fix me up food, keep house for me generally." There was a murmur of dissent. "Don't worry about old Carter. He's loyal; wild horses couldn't drag anything out of him. Besides, he's an excellent shot."

"I'll stay with you," Dribble broke in suddenly.

"Glad to have you," Cornelius said cordially. He was taking over executive control with a rapidity that astounded, yet rather pleased the scientists. It would give them more time for the purely technical end of their strange war.

"Now for supplies," Van Wyck continued. "I see you have a truck in the garage. That's fine. Whatever you chaps need, we'll order through dummies, have it shipped to scattered points. We'll pick up our loads at night, run them in here. Got another idea." He turned to Lake Forrest. "How soon could you get us a submarine? It must be small, speedy, and equipped with all the gadgets."

Forrest smiled. "In two weeks. I'll put day and night shifts on it at the plant. I've already developed plans; there'll be some quite new wrinkles."

"Splendid. I'll get some soldiers of fortune I know who are down on their luck to dig a tunnel out into the river, with an airlock and all. I'll rely on you for the

technical end of the construction. That will give us complete secrecy in getting out and in. When they're through, I'll give the workers transportation to the other ends of the earth with a stake, and they'll forget completely. What'll our first job be?"

Dr. Kuniyoshi spoke in soft, hissing syllables. "Let us put an end to the most deplorable war in Manchuria. My country has embarked on an adventure whose end may mean the end of civilization. We must stop her before it is too late."

Van Wyck whistled. That *was* a large order!

"It is too big for us now," Roode interposed decisively. "We must start on something small."

Kuniyoshi inclined his head. "You are right, honored friend, but we must come to it, we must come to it."

"Why not start on the Liquor Combine?" Cornelius inquired. "Especially as they seem to have opened the ball by starting on us, or on me, I don't know which. They've pretty well got the country by the throat, repeal or no repeal. The legitimate brewers and distillers haven't a chance. Only yesterday morning Ribling's brewery was smashed to bits by a bombing plane that dropped a crate of eggs on it. Thirty people were killed. All because he refused to join up with the combine. It was that incident that was responsible for my—er—brief and well-chosen remarks last night."

Randolph drawled: "The Liquor Racket is no doubt the typical sore afflicting America today. Here you can see it on the chart." He rose slowly, moved with a lazy grace to a large map pinned to the wall of a tiny alcove. "This map," he explained, "shows the energy determinants of the various areas of the country according to our own revised data based on technocratic calculations. The white areas give the figures. But actually, we have only the amount shown by the red shaded areas. A large part of the considerable deficiency, if you will glance at the figures, may be definitely attributed to the machinations of the Liquor Combine."

"Furthermore," said Harmon, "the most dangerous and anti-social of all public enemies is at the head of it. This man who is known even to his own associates only as the Boss, has never been seen by outsiders. If left alone, he will continue with the process of absorbing other illegal rackets until there is no telling what may happen. The fate of our larger plan depends on smashing him and all he stands for."

There was a general ripple of assent. War had been officially declared!

"How do we communicate with each other?" Peasely asked.

Silversmith's dark face lit up.

"For the past five years," he said, "I've been working on a compact portable combination sending and receiving set. About six months ago I had it perfected, and was about to turn it over to American Radio when Roode spoke to me. I saved it for our purposes. It's a very simple affair; flat and not over three inches across. It can be strapped to the chest under your clothing. It will be set for a fixed wave length and have a sending radius of about twenty-five miles."

Suggestion followed suggestion in rapid succession after that. Time and again Van Wyck was astounded at the calm assurance with which these men casually tossed off scientific ideas that seemed to his lay mind positively miraculous. It was midnight by the time they broke up, plans for the first onslaught already tentatively laid out. It would take a month, however, before all the requisite apparatus could be assembled.

Before they left, small groups at intervals in the waiting sedans, each of which was equipped with a special silencer to muffle the noise of its exhaust, Van Wyck asked one further question of Adam Roode.

"What would you have done if I refused to come in after you had imparted all your secrets?"

The scientist looked at him gravely and steadily before replying. When he did, it was with the air of weighing his words.

"We could not afford to have any one outside our group aware of our plans. We had decided on the procedure. Dr. Meyran would have operated on you to induce partial aphasia. He has developed a remarkable technique for operations of that sort."

CHAPTER III

The Man Known As—

● The man known only as the Boss leaned back in his swivel chair and stared reflectively at the two sullen men before him. He did not look like the accepted idea of a boss racketeer; that portly front and jelly-quivering jowls comported more easily with the success story of a boom-days realtor or a retired manufacturer of widgets. When he laughed, and he was careful to do so frequently, his whole body shook, chortling wheezy sounds gurgled from a fat throat; but somehow there was no mirth to it, no merry glint to the pale blue eyes.

Yet he was head and front of the great Liquor Combine that had sprung full-fashioned from his fertile brain the day the Prohibition Amendment had been repealed. Coming mysteriously from Cleveland, with unlimited funds and no background of lawlessness, he had somehow gained the respectful attention of the panicky "big shots" of the liquor racket, who saw huge profits melting away with the return of legal beer and wines, not to speak of stronger stuff.

He had combined them into one huge organization, with himself as General Manager. He had set up dozens of breweries and distilleries in the fastnesses of remote sections, and then had proceeded systematically to purchase official after official, offering substantial cuts to the important ones. As a result, the Ring's stuff was distributed tax-free; the government lost important revenues, and the legitimate tax-paying brewers and distillers met with unbeatable competition.

But the Boss was not satisfied. He wanted an iron-clad monopoly. Accordingly he offered these outsiders niches in the illegal racket, on conditions. Those who refused, and continued in business, found their trucks highjacked, their plants bombed, and themselves taken for a "ride."

It was a reign of terror of the most ruthless kind, with the various law-enforcement agencies seemingly helpless in the face of it—or bought off.

"Well?" asked the Boss.

"It's just what I've told you before, sir," said the slighter and darker of the two men nervously. He was manager of field operations. "Another one of our boats gone, right off Sandy Hook. The *Mary Gaynor* this time, with a hundred thousand dollars worth of choice French wines on board."

The Boss shifted his enormous bulk slightly.

"You took every precaution?" he said mildly.

The manager's name was John Terry. He had been a noted martinet and disciplinarian while a colonel in the Marines, yet he answered defensively.

"I tried not to overlook a thing. The crew was hand-picked; every man was searched before boarding the vessel. She was equipped with rapid-firers manned by former Coast Guard gunners. A bombing plane met her a hundred miles out, escorted her in. Yet she sank all the same."

The Boss said: "How did it happen? Same as the others?"

The manager answered: "Here is the captain. He can tell you."

The second man, tall and powerfully built, with red, weatherbeaten face, twisted his seaman's cap nervously in his hands.

"I just don't rightly know *what* happened. It was all so sudden-like. There we were, one moment a-sailing along on a calm sea, not a thing in sight, a good hundred-tonner and fit as a fiddle; and the next moment we were dragged down, so help me. Like as if some'un had reached up for us. I had to swim like hell to get out of the suction, and when I was able to turn around, there's nary a sign of the old lady, not a ripple to show where she foundered. Only the seven o' the crew, their heads bobbin', an' swimming furiously."

The captain paused and wiped perspiring forehead with a red bandanna.

"It wasn't so nice, Boss. Fifteen miles take a heap o' powerful swimming, and the plane couldn't've saved more than one or two of us. But just then something comes shootin' out o' the sea, end up, bobs around a bit, and rights itself. It's a raft; a nice aluminum affair with air compartments and tins o' provisions and water lashed on snug and shipshape. We scrambled on board an' floated around until the plane's radio brought a speed boat out after us."

"You may go," the fat man nodded to the sea-faring man. That worthy retired precipitously, glad to be let off so easy.

"You see, sir," said the manager, "it's the same every time. That makes the fourth boat. Take our planes, too, within two weeks, seven of our Montreal planes crashed. I know the pilots; good, sober lads with excellent records. Every mother's son swears his controls were right; the motors carefully overhauled before each trip. Yet the motors stalled suddenly, without even a sputter. The pilots had to take to their chutes."

The Boss let his vast bulk teeter back, stared thoughtfully out of the window at the vast expanse of sky. Through the open door that led to the outer offices, he saw the ordered efficiency of big business. Trim typists worked swiftly at noiseless machines; busy executives dictated into dictaphones, interviewed callers, ruffled through heaps of assorted papers on their desks. A big banking establishment, the casual visitor would have said admiringly; the epitome of big business.

The Boss turned his eyes back again.

"Any ideas?" he asked.

Ex-Colonel Terry grunted. "Not many. There's no question some one is tagging us for destruction. But who is he, and how is he doing it? It sounds impossible. At first I thought it was young Van Wyck. Michaels, head of our Secret Service, gave me a memo on him. Disappeared some two months ago after threatening to make war on us; and five million dollars was withdrawn from his private account the next day. But—I can't see him on this. They're uncanny, these mysterious attacks."

● The fat man threw his whole weight back and laughed in wheezing gurgles. They were not pleasant to hear.

"Let us go into this a bit more carefully," he said when he had recovered himself. He pressed a button under his desk.

"Get me Burns," he spoke into the flat microphone disk on his desk. "I want the financial reports for the last two weeks."

It was not over a minute when a small, mouse-like man walked into the room, a huge portfolio under his arm.

The Boss looked at him. "What were our losses due to accidents during the period?"

The little man, chief of the accounting division, ran a skilful finger down the top sheet in his portfolio.

"One million, three hundred and sixty five thousand dollars," he announced.

"And our total operations?"

"Over fifty seven millions."

"That is all, Burns." The accountant bowed and went quietly out.

"Nothing to worry about yet, eh?"

"No, but if it keeps up—"

The Boss stood up. His height was deceptive; he towered over Terry.

"Even if it were only a dollar's worth that was destroyed, we cannot tolerate it. Whoever was responsible, *must* be hunted down relentlessly. Let me show you more." He pressed a button under his desk. A long shallow compartment shot noiselessly forward. It was full of neatly flattened papers.

He took a bundle out, took off the clips and tossed the first sheet over to Terry. "Look at this. I had Michaels get it together for me."

It was a long sheet of tough bond paper on which was pasted a series of newspaper clippings mostly headlines.

Terry read them:

"MILLIONAIRE POLO-PLAYER VENTURES IN NEW FIELD. COMPETES WITH PROFESSIONALS IN AERIAL DERBY. TAKES SECOND PLACE."

"FAMOUS SPORTSMAN-ADVENTURER ACHIEVES NEW GLORY. PILOTS SUBMARINE TO NEW RECORD DEPTHS."

There were many others, all featuring the reckless, daredevil exploits of one Cornelius Van Wyck, millionaire.

"Certainly," said Terry. "I knew this; it isn't new. But they don't mean—"

"Of course not," interrupted the Boss. "Now keep quiet, and let me read you some more." He leafed among the papers and extracted several.

"Jan. 16, 1937. WORLD RENOWNED PHYSICIST DISAPPEARS. OFFICIALS OF GENERAL POWER CO. PROFESS IGNORANCE OF ROODE'S WHEREABOUTS."

"Jan. 30, 1937. LAKE FORREST STILL NOT FOUND. SUBMARINE EXPERT WORRIES FRIENDS AND ASSOCIATES."

"Jan. 25, 1937. PAT McCARTHY NOT REPORTED SINCE TRIAL SPIN IN NEW STRATOSPHERE PLANE."

"Feb. 4, 1937. PASSENGER IDENTIFIES PICTURE

OF JAP BIOLOGIST, LONG MISSING, AS FELLOW-TRAVELER ON TAKU MIURA, FRISCO-BOUND. LEGATION REQUESTS SEARCH."

Terry goggled and said protestingly. "But what has this to do—?"

The Boss chuckled his wheezy, mirthless laugh. "There," he said, "is the reason I'm Boss of the Combine, and you—you're field manager. You cannot see the connection, eh? Let me—"

But what he was going to say was never completed. For just then, in that soundproofed, inner sanctum of the great Liquor Trust, a voice spoke startlingly.

"Raymond Melchior; Raymond Melchior," it repeated. "You are not taking our warnings to heart. Last night your gunmen murdered John Ribling for daring to reopen his brewery. Our patience is exhausted. We will smash you within the week. The Liquor Racket must go."

The bodiless voice ceased, and for a long moment there was silence. John Terry, ex-Colonel of Marines, sprang to his feet, hand to hip. Outside, the ordinary muted noises of the great establishment filtered through the shut door. They had not heard!

At the first sound of the repeated name, the Boss had swivelled sharply around. A corpse-like pallor enveloped him, his clothes seemed suddenly sizes too large for the shrunken body within. The chuckle had died in his throat with a little rattling sound.

He sprang from his chair as the warning note ceased. His face suffused a dark red. With an agility surprising in a man of his bulk, he flung himself upon the roughly Craftexed walls, tapping and pounding upon them in a very agony of impatience. Terry watched him with frightened eyes. The Boss had gone mad!

Little animal sobs burst from the fat man known as the Boss as his frantic search failed to disclose anything. He completed the circuit of the walls; nothing remained except the large panelled window that flooded the interior with the last rays of the westering sun. It was seven hundred feet to the city streets; above were the last thin spire of the Larkin Tower and the vast reaches of the sky.

Yet he did not hesitate. He heaved at the window with such maniac fury that the glass broke and fell splintering upon startled pedestrians, hundreds of feet below.

"A-a-ah!" It was a long drawn exhalation. Terry rushed to the jagged casement in time to see the Boss reach out, pull savagely at something. There was a ripping, tearing sound, and the fat man fell back into the room, holding in his hand a tiny black box with a funnel opening, from which several lengths of broken wire were trailing.

"For God's sake, what is it?"

● The Boss was panting slightly, and there was a queer strained look about his eyes as he stared at the thing in his hand. He seemed to have forgotten his underling's presence.

"So it's war to the hilt, eh?" he said softly. "Very well, so be it. Take care for yourselves!"

Then he pivoted on his field manager.

"Not a word of this to anyone," he said harshly, his blue eyes grim and glowing. "To *anyone*, do you hear?"

"Y-yes, sir."

The fat man took a long breath, and chuckled. "This thing?" He threw the black box on the table. "A very, very clever apparatus. I'll have Winthrop in to explain it." He spoke into the microphone.

The chief of the Science Division, dignified, efficient, came at the summons.

The Boss indicated the box. "What is it, Winthrop?"

The scientist, former chairman of a department at a great Eastern University at less than one third his present salary, picked it up and examined it very carefully.

"It looks to me as if it were a radio receiving unit, but of a most unusual type. I've never seen anything like it before."

The Boss nodded. "I thought that was it. Tell me, Winthrop, have you gone into those questions I referred to you?"

"Yes, sir. I've checked them with my staff. It is our considered opinion that the ignition system of the motors used in our planes was smothered under a broadcast blanketing wave of unknown power and intensity."

"What is the solution?"

"Destruction of the source of power, or installation of Diesel-type motors that require no magnetos."

"How about the loss of our ships?"

"No doubt due to a new form of submarine attack. We suggest installation of sound-detectors, use of torpedoes and depth bombs."

"How long will it take to make the necessary installations on sixty ships and seven hundred odd planes?"

The science chief shrugged. "I can get out the plans complete within a week. As for the installations, that is the job of the Equipment Division."

"I want the plans by tomorrow noon," said the Boss. "Wait." He spoke into the microphone. "Send in Michaels, of the Secret Service, Galton of Equipment, Norris of Public Relations."

Terry listened respectfully to the ensuing War Conference, heard the swift orders to each of the department heads. But underneath, his mind was busy. He knew now who his mysterious Boss was! *Raymond Melchior!*

• • •

Van Wyck maneuvered the little submarine skilfully along the bottom of the East River until his narrow-beamed searchlight picked out the entrance to the tunneled lock beneath the brewery. He pointed the nose to the black yawning hole, reduced speed, set the sono-device, and released the controls. The metal fish warped its way into the narrow opening, contacted the end of the lock without the tiniest of jars, and automatic machinery started pumping water out of the air chambers.

The landing device was Forrest's own invention. Sound waves were promulgated through the water, and rebounded from the sides of the tunnel to impinge upon the delicate controls of the steering apparatus, thus constantly guiding the submarine at a safe distance to its berth.

"All right, men," Van Wyck said to his crew of three, rangy, leathery men with the sniff of salt about them. They nodded silently, passed through the cramped ejector-lock into the by-now dry air-chamber. They were but three of some fifty gentlemen adventurers, soldiers of fortune, trained technicians, mechanics, whom the millionaire had carefully hand-picked for the initial digging of the underwater tunnel, and then decided to maintain for further work and possible emergencies in special barracks installed for them on the third and top floor of the converted brewery.

A reckless, hardbitten lot who relished the three squares a day, the good pay and lazy life between spells of hard,

feverish work. True, their freedom was circumscribed to the four walls of the brewery and special missions outside under control, but one couldn't have everything, they said philosophically. A loyal, enthusiastic lot, withal.

Van Wyck remained behind for a final inspection of the submarine. He was inordinately proud of it, and of the feat he had just accomplished. It was fish-shaped, and tapered to blunt, saw-toothed rams at either end. It was driven by internal combustion engines of a new type that sent the craft hurtling through the water at a speed far greater than ever achieved before. The combustion products were led off into the water ballast tanks, so that there was no chance for deadly gases to accumulate, as in the case of the old-fashioned storage batteries. The oxygenation apparatus kept the interior supplied with fresh clean air for periods of over two weeks. Sono-devices gave the exact location of surface ships up to five miles distance.

CHAPTER IV

Attack!

● Van Wyck took a last glance around, entered the air-lock, climbed the ladder, and emerged onto the floor of the brewery. It had been greatly changed in the past two months. Over half the great expanse was devoted to complicated whirring machinery that had been assembled bit by bit and brought in at dead of night. Men moved deftly within this eccentric dance of power, tending, adjusting, fashioning.

He walked through the maze, entered the executive office. Dribble was just shutting off the broadcasting unit; his face was pale with repressed emotion. Lord Wollaston and Rudolph Chess lounged in great chairs, pipes in mouth. Their particular researches, conducted in the laboratories on the second floor, were progressing nicely. Almost at the very beginning it had been decided that the planned war was a whole-time job; accordingly the scientists had abandoned their stations in the outside world and were living in quarters on the third floor.

Roode, who had been standing close to Dribble, turned sharply at Van Wyck's entrance. His face was also lined with emotion, but it relaxed at the sight of the young man.

"Glad you're back. We were a bit worried. What luck?"

"Splendid!" Van Wyck said enthusiastically. "The *Volstead's* resting comfortably in a watery grave off the Jersey banks. Brand new thousand-ton steel ship on its maiden voyage out of Glasgow, loaded to the hilt with Scotch and Irish whiskey and liqueurs. This'll set the Trust back several million dollars."

"Did you have much trouble?"

"None at all. And I was worried a lot, too, when our English emissary wirelessed that code message. I'd never tackled a boat that big before. But it went off fine. We cruised back and forth in front of the little bay they used as an unloading point, submerging every time a fishing smack went by. It was a day after we had taken our station that we sighted her, low on the horizon.

"We went under and put on full power. I took electronic pictures as we scuttled along, some ten fathoms down, to make sure it was the right craft. It was the *Volstead* all right.

"When our distance sounders told us we were directly underneath, I threw out the magnetic clamp, turned on the juice, and we rose until we gripped tight on the submerged hull. It was simple after that. The magnetised flexible steel hoses ran off the revolving drums fore and aft, attached themselves to the hull. Then we forced out the liquid hydrogen and oxygen, to be united at the tip, and ignited by a spark. It went through the sheathing of the hull like a knife through hot butter.

"As we drew in the hoses, they ran along the edge, burning their way through, until, just as we cast off, the whole bottom of the boat dropped sizzling. We had to dive fast and deep to miss being crushed. The worst part of the whole business is releasing the aluminum rafts and hanging around, watching in the electronic visors to make sure every man of the crew reaches safety. I was sure for a while we'd have to come to the surface to rescue some of the poor devils. That ship carried a large crew."

"Let them drown," Dribble broke in violently.

Van Wyck stared at him with brows knit.

"I thought it was clearly understood in the beginning that we were to take no lives except in self-defense," he said coldly. "Those fellows are seamen, most of them, glad to take any job where the pay is good."

"Peter didn't quite mean that," Roode said kindly. "He's under rather a nervous strain; so am I, for that matter."

"What's happened?" Cornelius asked quickly.

"John Ribling was killed. Taken for a 'ride' by the Liquor Trust last night. He had rebuilt and reopened his brewery. I don't know if Dribble has ever told you, but he was Dribble's favorite uncle, and a very close friend of mine too. As a matter of fact this place was his."

Van Wyck said harshly: "We must get the Boss for this. Find out who he is, and crush him like a snake."

"We've already discovered his identity," said Dribble grimly.

"You have!" echoed Cornelius in surprise. "That's a trick no one else has been able to accomplish. Enters and exits from his headquarters in the Larkin Tower by secret passages; no outsider has ever seen him; it's even rumored his own men don't know who he is."

"They don't. When we got the news last night, Mr. Roode determined on action. McCarthy and I went out in one of the small 'copter planes, poised her at the window of the private office where we had been told the Boss sat in state every day. Pat kept the plane steady while I lay flat on the wing and attached a receiving set with inset loud speaker to the outer frame, and also the lens end of a special movie camera that Harmon and Wollaston—excuse me, Lord Wollaston, collaborated on."

The nobleman grinned from the depths of his chair, puffed out a huge cloud of smoke, and murmured: "The young man is pulling my leg, what?"

Peter went on: "It's a clever affair. The lens is at the end of an adjustable length of hose; the image is carried by periscope mirrors up the hose to the camera, which we affixed to the top of the Tower, some fifty feet above. A timing mechanism started it grinding at nine this morning; another clockwork contraption released exactly at noon a balloon to which the movie camera was attached, also releasing the spring clips that held it all in place, and it sailed sky-high. Of course, Pat and I were casually winging past at the time; we grabbed it and returned to develop the film. We have complete pictures of everything that happened in that office this morning."

"And the Boss is—"

"I recognized him at once," said Roode quietly. "He is Raymond Melchior."

"Melchior!" Van Wyck repeated in puzzled accents. "Melchior! The name sounds familiar. Wait—wasn't that the banker who went to jail back in 1933 for cleaning out the National State Bank?"

● Roode nodded. "The same. One of the biggest and most ruthless men in the banking business at the time, and the least known. Had a horror for all kinds of publicity. Never had a picture taken. It was reported that he had manipulated at least twenty million dollars into his pocket before the bank closed its doors. Did it so cleverly that all they could convict him on was a technical charge of failing to pay a proper income tax. I've done some checking up today. He was released from San Quentin a little over two years ago, and promptly dropped out of sight."

"But surely some one in his own organization would have recognized him as the Boss," Van Wyck protested. "Melchior was an internationally known figure."

"You forget several things," Roode pointed out. "He is seen only by his present associates, who naturally had not been intimate with him in the old days. His picture has never been published; even during the trial he managed to evade the photographers. And furthermore, whereas I knew him as a rather tall, thin individual, he has since grown extremely fat, and his height has been masked to the casual eye. I myself would not have recognized him had he not been guilty of certain habitual movements of his hands. You see, this banker pillar of society had been a trustee of the University before his downfall."

"I remember the case now," Van Wyck said thoughtfully. "They never traced the twenty million. He cached it safely. But then, with all that wealth, why did he not retire to Europe, live in splendor, instead of partaking in a dangerous game like the Liquor Combine?"

"Dangerous?" Roode echoed bitterly. "It hasn't been dangerous as yet, unless *we* make it so. It's been big business, fast on the road to utter respectability. I wouldn't be surprised if others of the banking gentry join in establishing similar rackets; the profits are immensely great. Besides, Melchior's stay in prison must have given him a definite anti-social complex, even if he didn't have one before. He is out for revenge on a society that punished him so mildly; he is seeking power. He always was ambitious—and inordinately vain. We must crush him, and without mercy. Dribble has just finished broadcasting a warning to him. He was given until the end of the week, but we must work faster. Tonight he must die; the power of the Trust must be crushed throughout the country."

"Do you intend bombing the Larkin Tower?" Van Wyck asked slowly.

"No. Too many innocent lives would be involved. There are other methods." The old scientist fixed him with a keen shrewd eye. "The expedition starts at midnight, McCarthy in command. Dribble is going, and I intended you as the third member. Do you care for the job?"

"Care for it! Try and keep me out of it. My objections were based simply on a distaste for taking human life without giving the other man a chance."

"I know, my boy," approved the other. "But remember, we are dealing with men who do not return the courtesy. Yet wherever possible, human lives are not to be taken. Only Melchior is marked for death; he is too dangerous a man to leave alive. In two years he would be Dictator in this country."

"Okay," said the young man lightly. "In that case I'll grab a shower, a bite to eat, and snatch a spot of sleep."

He went out whistling; he was never so cheerful as when there was danger and adventure ahead.

Up the moving ramp to the second floor where he nodded to various scientists at work in the laboratory. They returned his greetings with half-absent nods, and plunged back in utter absorption into the numberless experiments under way. This was their life, their passion.

Cornelius grinned quizzically, and went on up to the barracks on the third floor. It was almost six in the evening, and the mess hall was crowded with a riotous confluence of men. They shouted huge greetings to him as he passed, and he shouted gaily in return. A heart-warming crew, profane, irreverent, but all the better in a tight hole.

He entered his own diggings, a tiny cubbyhole of a room, bare of everything but a cot, a rough pine box pretending to be a dresser, and two chairs. Carter was bending over the cot, laying out khaki shirt and trousers, worn puttees, leather jacket and helmet, with the same meticulous care as if they were immaculate evening clothes and the room the luxurious penthouse apartment on Gramercy Place.

"Hello, old bean," said Cornelius boisterously, "I'm back, as you see. Is the bath drawn?"

It was a standing jest, and Carter answered as gravely as ever. "There is, I believe, a waiting list ahead of you, sir." One of the huge beer vats had been converted into a shower room; the men pranced around on its copper bottom and were showered with water drawn through the specially perforated ammonia pipes above. "But you are going out tonight, sir, and I have taken the liberty to lay out your clothes, sir."

● Van Wyck stared at the "clothes." "How did you know I was going to need those?"

"It is a matter of common knowledge, sir." Then Carter proceeded to cough delicately.

"All right, Carter, what is it now?"

"If it wouldn't be presuming too much, sir, I'd like to be a member of the expedition."

"W-what?" yelled his master, taken off guard.

"Yes, sir." Carter looked steadily in front of him. "I'm given to understand the expedition is by airplane, and I—I was once a humble member of His Majesty's Royal Air Force."

"And a damn good one, I've heard," Van Wyck said cordially. "Was it nine German planes you winged?"

"Only eight, sir."

"Well, I've no objection. But Pat McCarthy is the leader of this particular sortie, and I'll have to put it up to him."

Carter bent low over the neatly pressed khaki outfit, patting each garment deftly into place.

"I've already asked Mr. McCarthy, sir, and he has expressed no opposition."

. . . . . .

Zero hour! Midnight! Four men sat in the enclosed, airtight cabin of the great stratosphere plane. McCarthy, at the controls, grinned and waved his hand to the crowding group visible through the glasaite ports. Van Wyck

yelled something, but of course he could not be heard. Dribble stared straight in front of him, weak with the weakness that comes to men at the zero hour. And Carter, butlerish and dignified, fitted strangely well into his aviator's khaki.

Roode signalled, and the crowd fell back. The platform rose swiftly to the roof, and became an integral part of the structure. The stars overhead wavered in the haze of New York. Then, with barely perceptible sound, helicopter vanes whirling aloft, the great plane took off almost perpendicularly. Straight up and up it went, until it was some five thousand feet above the glare of the huge, sprawling city. It showed no lights and the keenest observer in the streets beneath would have seen only a tiny shadowy blob.

Then for the first time McCarthy spoke to his companions.

"We're headed for the Larkin Tower. It's our first port of call."

Van Wyck said sharply: "You're going to bomb it?"

Pat grinned his wide Irish grin: "Don't go off half cock, young fellow. We're aiming only for the Boss himself. Here's the layout. One of you is to take the baby 'chute and drop to his office window."

"Parachute? You're crazy, man; it'll drift any old way."

Pat chuckled. "Mine won't. It's a little invention of my own. Here, take a look at it."

He opened a compartment and dragged out what appeared at first sight to be a typical parachute of standard size with straps for body attachment. But there was a light aluminum shield from which projected an oblong box of the same material, to which in turn was attached a propeller, some two feet across and of advanced airplane design.

McCarthy surveyed his brain child with fond pride. "This," he said, "will make a good ten miles per hour; and there's sufficient juice in the actuating storage battery to cruise comfortably twenty-five miles in calm air. This contraption," he pointed to a handle bar arrangement in front, "is the joy stick, and here," attached to the rear of the strap were two vanes, concave on their outer surfaces, "are what you might call the rudders. Simple, compact, and safe enough if you don't hit a storm."

"But why, sir," said Carter, eyeing the affair with manifest distaste, "don't you use a regular plane to gain entrance?"

"Because this bus is miles too big, and the small pursuit planes require two men to handle, and particularly myself at the controls. It's the time element tonight that's so damned important."

Van Wyck opened his mouth to say. "I'll take a—" when Dribble broke in hurriedly, almost feverishly. "I'll go! I'll go!" to ward off other claimants, and he started fumbling at the straps.

"Okay, old man," Pat said kindly. He reached over to a stand where a heart-shaped bag of rubberized material lay carefully swathed in cotton. He took it out gingerly. There was a tiny nozzle in the tip and a lens at the blunt end. "This little toy contains two capsules; one filled with an aqueous solution of potassium cyanide, and the other, concentrated sulphuric acid. Behind them both is a steel tube of air under tremendous compression. The lens in the rear is the eyepiece of a photoelectric cell. A change in light will turn valves in the capsules and the compressed air tube. You readily see what happens if this is placed in a drawer in the Boss's private desk. The shift from darkness to light as the drawer slides open would actuate the cell; the valves turn, the sulphuric and cyanide mix, and the compressed air blows the resultant hydrocyanic acid gas flush over the man whose desk it is."

Van Wyck shuddered. "I don't like it," he said. "It's murder."

"No," McCarthy told him harshly. "It's war, stripped to the waist; ruthless; no false glamor. That man has been responsible already for the killing of over a thousand men. You'd set off a mine in warfare, over which enemy troops were marching, without compunction, wouldn't you?"

Van Wyck sighed. "I suppose you're right," he said unwillingly.

Dribble's eyes were feverish. "Then what do I do?"

"Climb out the window, set the motor working, and head for home. You have a clear airfield from the Tower. In any event steer for the river, so that if anything goes wrong; you'll hit fairly soft."

"It seems to me, sir," interposed Carter, "it would be simpler and easier to walk down stairs."

Pat smiled. "That building is a death trap for unwanted intruders. The Boss is no fool."

● While the great craft drifted idly under its whirling vanes at the five thousand-foot level, Peter was installed swiftly into his queer self-propelled 'chute. The last goodbye had been said, the last warm handshake, when McCarthy exclaimed suddenly: "I nearly forgot. There's a spring near the 'eye' to set it going. Press it and you have exactly one minute before it works. So make sure you have the drawer shut in time."

He stepped back, pulled a lever. Peter catapulted out through a trap-door that sprang immediately into place again. The men stared down with beating hearts at the tiny whirling figure in the immensities. Then, timed to the second, the great silk bag bellied and jerked Dribble's free fall to a slow, drifting, downward motion. The expanse of the 'chute prevented them from seeing what he was doing, but after breathless seconds, the ghostly white apparatus moved purposefully on a long steep slant. Far beneath, the topmost spire of the Larkin Tower showed as a tiny pinprick on an illuminated jigsaw puzzle.

Van Wyck fetched a deep breath. "I hope he makes it. Maybe we'd better wait; something's bothering me."

"Can't. We have a full night ahead of us."

McCarthy advanced his motors to full speed ahead, tilted the plane skyward. There was a deep humming vibration as the great bird zoomed aloft. At the sixty thousand-foot level he leveled off, locked the controls at a steady speed of five hundred miles an hour. Then he took out a huge chart, showing the United States in outline. It was covered with red dots, some thirty-five of them, scattered over the wide expanse of white. They ranged from the Great Smokies in the South to the forested areas in the region of the Great Lakes.

"Each of those dots," Pat explained to his companions, represents an illicit brewery or distillery of the Combine. It took our agents over a month to ferret them out, and no doubt there are more. But with those destroyed, and the Boss dreaming of bitter almonds, the back of the Trust will be broken for good."

"Bombs, of course," repeated Van Wyck tonelessly.

"Yes." Pat's eyes twinkled as he fell into a thick Irish brogue. "Shure, an' ye're a br-roth uv a bhoy, wid yur white liver an' humane instincts." Then in normal English. "We're not killing a dog if we can help it. I drop at minute intervals for fifteen minutes warning bombs that blaze a light trail and explode with enough noise to wake the dead. They do no damage. At the end of that time there won't be a soul in our objectives; they'll be taking to the hills as fast as their legs can move. Then I empty a crate of Peasley's improved *dynols*, and every one'll swear the moon dropped out of the sky."

Van Wyck bucked up. "That's different," he exclaimed. "Get going."

Steadily the plane cleaved the stratosphere toward their first objective; a distillery in the heart of the Smokies.

CHAPTER V

Counter-Attack!

● Peter Dribble swung agonizedly downward. The city seemed an abyss; he suffered horribly from vertigo. But he set his teeth, and steered on a long slant toward the upward rushing Tower. He was on his own, a man of action, rather than a scientist. The vertigo passed, and a warm enveloping thrill took its place. He who had secretly envied Van Wyck's exploits was now a brother adventurer.

The 'chute was working perfectly as he swung around the dark looming Tower until he found the window he was seeking. To his surprise it was open, invitingly so. But Dribble gave it no further thought, and thrust the jimmy he had prepared back into its sheathing. A last look around. Not a light anywhere; not a plane in the sky; only the muted roar of the city seven hundred feet beneath.

Yet he knew that the innocuous-seeming Tower was a death trap; at least the upper floors housing the Liquor Combine. Doors, stairs, were electrically charged against unwary intruders.

Without hesitation he balanced on the sill, hooked a foot inside, unstrapped the 'chute and let it dangle from a projection outside. He was in the room now, flashlight playing around. Nothing stirred; it was quiet as the tomb. Peter extracted the deadly rubber capsule from its container, advanced to the desk that posed prominently in the center of the room. His heart was beating rapidly; the silence was somehow ominous. But the building was dead as only a office tower can be at night.

He placed one hand on the edge of the flat desk to steady himself as he bent to search for the buttons that opened the drawer. There was a faint hissing sound, but he did not hear it in his eagerness. He found the banked buttons, pressed one at random. A long, flat tray, filled with clipped papers, slid silently open. He did not know that all the buttons had been switched that afternoon so that only that particular drawer would open.

He picked up the deadly instrument; his finger was on the spring to set it, when the flashlight illuminated a sheet of paper on top of the clipped pile. It had typewriting on it in bold caps. He paused to read it and thereby saved his life.

"WELCOME"; it stated, "YOU ARE EXPECTED. AS YOU READ THIS A POWERFUL SLEEP-INDUCING GAS HAS ALREADY PENETRATED YOUR LUNGS: YOU ARE NOT TO DIE—YET—"

Dribble read thus far with dazed horror. Then as the full purport struck his senses, he tried to run, back to the window, anywhere. But his limbs suddenly refused to coordinate; they numbed and swayed. A cloud swept over his mind; there was a steady roaring in his ears. His last consciousness was of stiffened fingers dropping the cyanogen capsule to the floor; he heard the faint thud, then he pitched headlong, the flashlight clattering into oblivious darkness. The jar of his fall released a mechanism at the base of the desk; there was a blinding flare, a huge poof of smoke, and again utter darkness.

Raymond Melchior, the Boss, saw the huge blast of light from the fifty-sixth floor window of the Squill Building, some three blocks away, removed the powerful night glasses from his eyes, and turned to field manager Terry with an air of quiet satisfaction.

"It has worked out perfectly." Then he chuckled until his whole fat body writhed in obscene undulations. "Brains, Terry, that's what counts! No wonder I'm *Boss!*"

. . . . . .

It was almost dawn. The abandoned roadhouse on the outskirts of Valhalla showed dark and deserted. But in an interior room, carefully shaded, Dribble staggered to his feet again for the twentieth time, swayed unsteadily, and faced his tormentors with fresh defiance. His face was drawn and bloody, his right arm hung limp, broken under merciless twisting, the soles of his feet were scorched and blistered from lighted matches, his body was a mass of bruises from savage, rib-breaking blows and kicks. But the spirit that flamed in his eyes was bright and unweakened.

"I won't tell you," he said doggedly for the hundredth time, "you might as well kill me now. You'll never know from me."

Terry's black eyes glittered. He motioned to his two thugs, and they moved forward threateningly; but the Boss stopped them with a wave of a fleshy hand. He surveyed his rebellious captive with mild pale blue eyes.

"If you don't talk, now," he said deliberately, "I'll—have you—operated on. A bit of brain removed, and you'll be a hopeless gibbering idiot through life. Pleasant prospect, eh?"

Shudders swept over Dribble's pain-wracked body, but his head was as high as ever.

"Even that," he stated distinctly, "won't get you what you want."

Melchior nodded casually. "All right, men, take him into the next room."

The executioners were moving forward when a faint voice burst into the room. "Peter Dribble; Peter Dribble," it intoned. "Where are you? Report at once."

The thugs stopped short in their tracks, Terry gave vent to a little exclamation, and whirled around. Even the Boss for the moment looked blank. But Dribble's involuntary cry told the story. He had forgotten about the thin flat disk strapped to his chest, and the search of his captors had failed to disclose it.

He twisted his mouth under his collar, and yelled: "Help! I'm captured by the Boss. I'm at—"

But Melchior was recovered from his temporary stupor. He moved with the speed of a striking snake; one great pudgy hand clamped down with surprising force on Peter's mouth, choking off further utterance, while his other hand ripped and tore at the buttoned shirt. It fell away, disclosing the apparatus, from which sounds still

issued: "Peter Dribble, what happened? Speak!"

"A-a-ah!" It was a soft, long drawn out suspiration. Practiced fingers found the switch, shut off a particularly worried appeal.

He turned to Dribble, helpless in the grip of his henchmen.

"We won't need you any more, my friend. This little receiver of yours will tell me everything. I'll take it around a bit, have Terry gurgle like a strangled fish-hound into it—he's very good at that—so as to wake up your people to further calls. Three different points will give me the direction of your broadcasting outfit, and then—" He made a significant gesture.

He watched Dribble being carried away, struggling and kicking.

"Get the car started," he snapped suddenly at the ex-colonel, "we're moving fast."

● The great stratosphere plane dropped steadily from the ten mile zone as it neared New York. It was slowing down from a steady speed of a thousand miles an hour. The hidden sun was already pearling the high thin wisps of cloud; in minutes the dawn light would filter down into the canyons of the city. McCarthy dropped fast, anxious to get into the old brewery before the lifting of the darkness disclosed them to strange eyes.

There was quiet jubilation within the cabin. Carter sat straight and dignified, but there was a reminiscent glitter in his eye.

Pat said jovially: "A clean sweep, eh, boys?"

Van Wyck said: "Not bad. Direct hits from heights of twenty thousand feet and over. They looked like moon craters." Then regretfully: "There was only one fight."

Pat slapped him on the back and roared. "A regular fire-eater, that's what you are. Never satisfied. You winged that pursuit plane very prettily with the machine gun."

The millionaire turned to him curiously. "Why didn't you send out the blanketing waves just as you used to do with the rum-running planes. They'd have done the trick just as well; damped out the ignition system and dropped him."

Pat shook his head. "Wasn't interested in killing those others; gave them a chance to jump. But this bird came after us with guns blazing. Besides," he grinned at Van Wyck, "I wanted to see how you could handle the quick-firers."

Roode met them as they stepped wearily out of the plane with haggard, drawn face. He barely heard their report, interrupted them almost at once.

"Peter," he gasped, "is captured. Melchior has him!"

Van Wyck staggered back. "What? How did it happen? Where is he?"

Roode explained hurriedly what little he knew; the cry for help that was strangled off; other little cries, strangely muffled, that came through at intermittent intervals.

"We're locating their source," he ended grimly. "Silversmith's on the job. They seem to come from different places, and he has a method of computing the angles. Here he comes now."

Silversmith burst into the room, waving a sheet of paper, covered with scrawled calculations. His eyes were tired, but burning.

"It's only approximate, of course," he said. "Hard to say at just what speed the car, if it was a car, was moving; or how the road twisted. But I'd say the focus of the four signals I plotted was about here." He unfolded a large map of New York City and the vicinity and penciled a little circle around the tiny village of Valhalla.

Van Wyck stared at the map, and memories came flooding. Of a certain roadhouse off the beaten path he had once stopped at before the repeal of Prohibition, of a casual remark of a friend recently that the Liquor Combine had purchased it and promptly closed it down. But—Dribble was being dragged off by car.

"Those cries for help you heard; are you sure it was Peter?" he asked abruptly.

Roode lifted haggard tensed face. "By God, Van Wyck!" he exploded. "Only the first cry was definitely Peter's voice; the others were unrecognizable."

"That's enough," Cornelius shouted. "I know where he is then. Hurry, Pat, get out a pursuit plane, full battle equipment. Quick, if you care for Dribble's life."

McCarthy was disciplined enough not to ask questions. He dived for the movable platform on which the small speedy plane rested. For five minutes everyone worked furiously, scientists, ground crew of the planes, in a jumble of shouted orders.

"Hurry! Hurry!" Van Wyck urged them on, himself sweating like a longshoreman. Every minute was like eternity. There was no time for explanations.

At long last the plane rose swiftly to the roof, took off in what was almost broad daylight. No time to worry now if they could be observed; their hidden headquarters discovered. Fortunately, very few people were stirring at this early hour and in this deserted neighborhood of decrepit warehouses. And there was no sound except the faintest of whines.

McCarthy levelled off at two thousand feet, darted north toward Valhalla with throttle wide open.

"What do you know?" Pat yelled as the wind whipped through the struts, howled past the open cockpit. It was a two-seater; just the two of them, and an open crate of engines of warfare, hurriedly assembled, at their feet.

"I know where Dribble is," Van Wyck yelled back. "In a certain roadhouse on a little dirt path off the Reservoir Road. That moving communication unit of his threw me off the track at first. Peter yelled the first time, but someone else was making the other sounds. Wonder why they took the set for a ride."

● But all their energies were fiercely concentrated on getting to Valhalla in the shortest possible time, otherwise they would readily have recognized the menace of that moving unit.

Within fifteen minutes after the take-off the plane was diving fiercely toward a little valley nestled in rolling hills that Cornelius had pointed out. Without slackening speed, McCarthy straightened out his dive at five hundred feet, and swooped around in dizzying circles. He was taking no chances on a rifle shot from some hidden marksmen.

Van Wyck stared downward at the long squat building, with its several extensions jutting crazily out. It was dark, silent, seemingly deserted.

He felt a sinking sensation in the pit of his stomach. Was his guess wrong? Maybe, but he'd have to make sure. He bent over and picked out of the racks in the crate a half dozen tiny bombs, leaned over the side as the

plane circled and circled, dropt them one by one.

They fell in the soft earth about the roadhouse and almost instantly huge volumes of white drifting smoke spread upward and outward, met similar drifting clouds, eddied a bit, and coalesced into a great blanket that completely enveloped the roadhouse. Nothing more could be seen but a bank of earth-embracing fog.

McCarthy smiled grimly. "Great stuff, that new tear gas!"

Thereupon he set the plane down gently on a little grassy patch not far from the inn, calmly confident that no one would dispute his passage. The tiniest crack would be enough to insure entrance of the tear gas into the house in overwhelming quantities.

They broke out gas masks, clamped them in position over their heads, strode hurriedly, guns in hand, toward the billowy mass. They plunged into it, special films on their goggles keeping them vapor and moisture-free, so that they could achieve faint vision. Heaves of two powerful shoulders broke open the door. The interior was thick with vapor—and deserted. Yet they did not give up hope. Doggedly, room after room, they searched. Nothing on the ground floor. Upstairs, with fast sinking hearts, they dragged weary feet. Again room after room until Van Wyck shouted in the confines of his helmet. He had stumbled over a body. He turned a flashlight on it. A man sprawled, a stranger, with thick bullet head and livid scar on one cheek. A little to one side lay another body, also unknown. A third could be dimly seen in a corner.

McCarthy was lifting it, waving free hand frantically. Van Wyck hurried over. In the irradiated ghastly light of the flash through the haze, he could make out the limp features of Dribble. Pale, bloody, agonized, without life.

As they hurried him out, carrying him between them, Cornelius kicked savagely at the prostrate bodies in passing. If Peter was dead—!

Once more in the plane, Pat worked frantically over their limp friend, using restoratives specially prepared for just such emergencies.

"He's alive," he shouted joyfully, as a pale eyelid fluttered once, and redoubled his efforts.

In ten minutes Dribble was able to gasp. The tear gas was harmless; its effects wore off normally in half an hour. It was the torture he had been subjected to that had almost killed him.

As his eyes opened and he say the anxious faces of his friends bending over him, his first audible words were: "Headquarters! Save them!"

"What do you mean?" both ejaculated simultaneously.

Strength was gradually flowing into the by-now seated man. It was a tremendous effort to talk, but he forced himself: "Melchior—used—unit—as direction—finder," he enunciated slowly and painfully. "Will attack Headquarters." Then he fainted.

Without another word the men piled into the plane, Van Wyck propping Dribble's lolling head between his legs; McCarthy ripped the little plane off the ground with such violence that the wings almost tore off. His ordinarily jovial grin was set in stern, hard lines.

Van Wyck said in a half groan: "Stupid of all of us. That was why those queer sounds came from different points. Meant to attract responses; easy enough to calculate the point of origin."

Pat said nothing; teeth clenched, hurtling the pursuit plane through the air at a suicidal four-fifty an hour.

Cornelius sat suddenly straight, yelled: "We are fools. I'll warn them."

He unbuttoned his shirt feverishly, turned the tiny microphone knob, spoke into it: "Headquarters, urgent, Van Wyck calling!" Over and over again; then he switched the receiving knob and listened. Squeals and howls and groans, nothing else. Nothing else that could be heard through that terrible static.

Once more he groaned. "The devil! He's blanketing our beam with a scrambled broadcast."

And McCarthy drove on.

At about Elmsford Cornelius, using field glasses, first saw the tiny speck far ahead, traveling fast. It was a plane.

"Faster," he urged on Pat, and that worthy shook his head. The throttle was wide open. They gained, but not fast enough; New York was already visible as a sprawling giant. Both planes were about three thousand feet up, and traveling at a terrific clip.

● Van Wyck held his glasses on the fleeing plane. By now he could make out two doll-like figures in the cockpit, one of whom seemed enormously fat. No question now that it was Melchior. The slighter figure had turned, was staring back at them. They knew they were being pursued.

Past Mount Vernon, over the Bronx they swept. Down over the Harlem River, a smoky dull smudge beneath. And still over a mile separted them.

"We'll never get them in time," McCarthy's face was a frozen mask. "They'll have dropped a crate of bombs, and—" It wasn't necessary to complete the sentence.

"Use your blanketing wave; make him crash," Van Wyck cried.

It was a face stricken in mortal agony that McCarthy turned on him. "It's the other plane that's equipped; not this. Forgot about it; we hurried so."

Melchior was beginning to drop. He was nearing his destination. Frantic with despair, Cornelius pumped the trigger of his rapid-firer. A stream of lead sped high over the unknowing city, but the range was too great.

Already Melchior was past Nineteenth, dropping fast. In seconds he would be directly over the old brewery—Van Wyck shuddered as if he already heard the sound of the smashing bombs. Dribble was stirring uneasily against his legs.

They were close enough to shoot now, but it was too late. The enemy plane had started to circle over the brewery. A direct hit would smash it, no doubt, but the crash would detonate the bombs and wipe out the whole area. Nevertheless, Van Wyck's fingers gripped the trigger.

McCarthy whooped, rummaged feverishly with one hand in the crate of equipment. He brought out a tiny phial, from which tinier pellets rolled out into his hand. He twisted deftly at each one in turn and literally thrust them on Cornelius.

"Load them in, quick. Our last chance!"

Van Wyck took one look at his desperately set face and dropped them rapidly into the revolving drum. No time for questions. Already the fat man was moving in the other plane, leaning over the side, something in his hand.

Cornelius had no time to aim; he let the gun go in swift bursts.

They were zooming down on the enemy's tail; Van Wyck saw everything with preternatural sharpness. Little things, like the glitter of sunlight on the shiny round ball in the fat man's hand, the staring upturned faces of pedestrians in the streets below, a tug puffing and grunting along on the black, sluggish river, pulling a monster of a freighter; the very course of the pellets leaden-crawling through the air. Time seemed to stand still in one great tableau.

As in slow motion picture he saw little puffs of steam impinging on the plane.

"What good!" he thought wearily to himself, "the bombs will fall just the same."

Then, with dramatic suddenness, it happened. He heard the sharp intake of breath from the seat beside him, but his eyes were riveted on the other plane. As the steam puffed out from the pellets, the plane gave a great convulsive heave, the fat man fell violently back into the cockpit, the glittering ball still in his hand; the next moment the bomber swooshed straight up into the heavens, long straight perpendicular streamers of steamy smoke keeping pace with the mad flight.

Even as Van Wyck craned his neck upward out of the slowing plane in unbelieving wonder, Melchior's craft was already a dwindling dot in the bright blue of the sky above, shooting outward with seemingly undiminished velocity.

"Thank God! Thank God!" McCarthy was praying.

"But wh-what was it?" his companion gasped.

Pat ignored the question, cocked a weather eye upward, grinned his old time grin, as he landed the plane gently.

"Goodbye, Boss," he waved his hand aloft. "Hope you reach the moon!"

Then as the platform dropped into their hangar, and they stepped stiff-leggedly out of the cockpit, with a very weak, but conscious Dribble between them, Van Wyck was aware of a tremendous scurrying to and fro, of a frightful consternation that almost rocked the building.

They found Roode in a frantic rush. He paused as he saw Peter, his worn face lit up, he practically fell on his neck.

The uproar seemed to be increasing. McCarthy grinned knowingly.

"I'm bursting with questions, and no one seems to care," Van Wyck cried out in half-assumed, half-real anger. "What's all this particular shooting for?"

Roode left Dribble on a bench, hurried over.

"Something went wrong with one of my most recent experiments," he said gravely. "I was experimenting with some ionized hydrogen, certain that there wasn't any other pellet of it around uninsulated, when suddenly it ripped, almost under my hands, right through the steel laboratory table, smashed its way through the floor, just missed Wollaston, hit the ground floor with a roar, burrowed downward, and by now—" he shrugged, "it must be nearing the center of the earth. I can't understand it; we've gone over our stock, and the insulation on every one of the remaining pellets is perfect."

McCarthy slapped his knee and laughed. "I think I can explain. We've knocked Melchior into kingdom come with it."

He ran over the events of that last crowded hour. When he came to the finale, he said: "I was desperate; didn't know what to do. Then I thought of those ionized hydrogen pellets stowed away in the crate. If we could get into range so that our marksman here," he indicated Van Wyck affectionately, "could tattoo their plane with them, and *if—there* was the chance—if you happened to be using one in an experiment, why the plan would work. And by George, it did!"

Roode shook his head as if he were awakening from a trance, saw Van Wyck standing slightly open-mouthed.

"You didn't know of my ionized hydrogen?"

Van Wyck said *no*.

"I stumbled across the process of creating sizeable amounts in the process of atomic disintegration. It had always been known, but in the minutest of quantities, and in a most unstable state. Didn't last more than a few seconds before losing its charge and becoming neutral hydrogen again. I found a method of making it stable." He fixed the young millionaire with a quizzical eye. "Now ionized hydrogen," he said, "is the most potent force in the world today, or rather, two separate quantities of it are. Soddy once calculated, theoretically, of course, that a gram of ionized hydrogen, placed at the North Pole, and another gram at the South Pole, would repel each other, at that distance, with a force equal to twenty-six tons. (See Note.)

"My researches have confirmed these figures. The next problem was to find an insulator for these terrific repulsive forces. All of us worked on that, and we discovered an alloy ultimately that was absolutely non-conducting. That little knob McCarthy twisted on the ones you shot loosened certain springs inside, so that the jar of contact with unyielding steel burst the pellets wide open, and let loose the repulsive force. It reacted at once to the uninsulated amount I was working with. The amounts, you must remember, were very much less than a gram; otherwise at such close quarters, you might almost be able to wreck the earth."

McCarthy laughed gustily. "Old Melchior must be landing on Mars by this time."

Roode said gravely: "He was a most dangerous antisocial being. Technocracy could never be established with such a man alive wielding the power he did."

Van Wyck said: "We'll have to move. The Liquor Racket is crushed beyond repair, but there's been too much publicity about it. Thirty odd holes in the ground, and Melchior's meteoric ascension, in full view of thousands of people, will create a vast uproar. The government will investigate, and it won't be long before they trail us here. We start dismantling at once. Tonight we use autos, truck, planes and sub. Must be out tomorrow morning. I have a private estate up the Coast that would be ideal. There we can plan the next world-problem to tackle."

(Note)—The Interpretation of the Atom, by Frederick Soddy (1932).

THE END

(Illustration by Paul)

Four beings were hovering in the air about the cairn without wings or other support. They were little less in stature than men.

The Light from Beyond

By CLARK ASHTON SMITH

● Clark Ashton Smith makes us aware that we are poor creatures after all. Our sense perceptions are woefully limited, we see, hear, smell, taste, very little of what is available to us. We live in a little world unaware of the sensual possibilities about us.

What would happen were it possible to expand our senses tremendously. We know what hashish and other drugs do to us; what if some drug, hundreds of times more potent were available and we were accidentally subjected to it. Only a master of literature could picture what a man would experience in such a state. Mr. Smith has attempted it in this story, and we think you will agree he has achieved remarkable success.

● It will be said, by nearly all who peruse this narrative, that I must have been mad from the beginning; that even the first of the phenomena related herein was a sensory hallucination betokening some grave disorder. It is possible that I am mad now, at those times when the gulfward-sliding tide of memory sweeps me away; those times when I am lost anew in the tracts of dreadful light and unknown entity that were opened before me by the last phase of my experience. But I was sane at the outset, and I am still sane enough to write down a sober and lucid account of all that occurred.

My solitary habit of life, as well as my reputation for eccentricity and extravagance, will no doubt be urged against me by many, to support the theory of mental unsoundness. Those who are unconventional enough to credit me with rationality will smile at my story and deem that I have forsaken the province of bizarre pictorial art (in which I have achieved a certain eminence) to invade that of super-scientific fiction.

However, if I wished, I could bring forward much corroborative evidence of the strange visitations. Some of the phenomena were remarked by other people in the locality; though I did not know this at the time, owing to my thorough isolation. One or two brief and obscure notices, giving a somewhat commonplace meteoric explanation, appeared shortly afterwards in metropolitan journals, and were reprinted even more briefly and obscurely in scientific gazettes. I shall not quote them here, since to do so would involve a repetition of details which, in themselves, are more or less doubtful and inconclusive.

I am Dorian Wiermoth. My series of illustrative paintings, based on the poems of Poe, will perhaps be familiar to some of my readers.

For a number of reasons, some of which it is needless to mention, I had decided to spend a whole year in the high Sierras. On the shore of a tiny sapphire tarn, in a valley sheltered by hemlocks and granite crags, I had built a rough cabin and had stocked it plentifully with provisions, books, and the materials of my art. For the time being, I was independent of a world whose charms and enchantments were, to say the least, no longer irresistible.

The region possessed, however, other allurements than those of seclusion. Everywhere, in the stark mountain masses and pinnacles, the juniper-studded cliffs, the glacier-moulded sheets of rock, there was a mingling of grandeur and grotesquery that appealed most intimately to my imagination. Though my drawings and paintings were never, in any sense, literal transcriptions of nature, and were often avowedly fantastic, I had made at all times a careful study of natural forms. I realized that the wildest evocations of the unknown are merely, at bottom, recombinations of known shapes and colors, even as the furthest worlds are compositions of elements familiar to terrene chemistry.

Therefore, I found much that was suggestive in this scenery; much that I could interweave with the arabesques of weirdly imaginative designs; or could render more directly, as pure landscape, in a semi-Japanese style with which I was then experimenting.

The place in which I had settled was remote from the state highway, the railroad, and the path of airplanes. My only near neighbors were the mountain crows and jays and chipmunks. Occasionally, in my rambles, I met a fisherman or hunter; but the region was miraculously free of tourists. I began a serene regimen of work and study, which was interrupted by no human agency. The thing that ended my stay so prematurely, came, I am sure, from a sphere that is not mapped by geographers, nor listed by astronomers.

The mystery began, without forewarning or prescience, on a quiet evening in July, after the scimitar-shaped moon had sheathed itself in the hemlocks. I was sitting in my cabin, reading, for relaxation, a detective story whose title I have since forgotten. The day had been quite warm; there was no wind in that sequestered valley; and the oil lamp was burning steadily between the half-open door and the wide windows.

Then, on the still air, there came a sudden aromatic perfume that filled the cabin like a flooding wave. It was not the resinous odor of the conifers, but a rich and ever-deepening spice that was wholly exotic to the region—perhaps alien to the Earth. It made me think of myrrh and sandal and incense; and yet it was none of these, but a stranger thing, whose very richness was pure and su-

pernal as the odors that were said to attend the apparition of the Holy Grail.

● Even as I inhaled it, startled, and wondering if I were the victim of some hallucination, I heard a faint music that was somehow allied to the perfume and inseparable from it. The sound, like a breathing of fairy flutes, ethereally sweet, thrilling, eldritch, was all about me in the room; and I seemed to hear it in my inmost brain, as one hears the sea-whisper in a shell.

I ran to the door, I flung it wide open, and stepped out into the azure-green evening. The perfume was everywhere, it arose before me, like the frankincense of veiled altars, from the tarn and the hemlocks, and it seemed to fall from the stilly burning stars above the Gothic trees and granite walls, to the north. Then, turning eastward, I saw the mysterious light that palpitated and revolved in a fan of broad beams upon the hill.

The light was soft, rather than brilliant, and I knew that it could be neither aurora nor airplane beacon. It was hueless—and yet somehow it seemed to include the intimation of a hundred colors lying beyond the familiar spectrum. The rays were like the spokes of a half-hidden wheel that turned slowly and more slowly, but did not change their position. Their center, or hub, was behind the hill. Presently they became stationary, except for a slight trembling. Against them, I saw the bowed masses of several mighty junipers.

I must have stood there for a long while, gaping and staring like any yokel who beholds a marvel beyond his comprehension. I still breathed the unearthly odor, but the music had grown fainter with the slackening of the wheel of light, and had fallen to a sub-auditory sighing—the suspicion of a murmur far away in some undiscovered world. Implicitly, though perhaps illogically, I connected the sound and the scent with that unexplained luminescence. Whether the wheel was just beyond the junipers, on the craggy hill-top, or a billion miles away in astronomic space, I could not decide; and it did not even occur to me that I could climb the hill and ascertain this particular for myself.

My main emotion was a sort of half-mystic wonder, a dreamy curiosity that did not prompt me to action. Idly I waited, with no clear awareness of the passing of time, till the wheel of rays began once more to revolve slowly. It swiftened, and presently I could no longer distinguish the separate beams. All I could see was a whirling disk, like a moon that spun dizzily but maintained the same position relative to the rocks and junipers. Then, without apparent recession, it grew dim and faded on the sapphire darkness. I heard no longer the remote and flute-like murmur; and the perfume ebbed from the valley like an outgoing tide, leaving but elusive wraiths of its unknown spicery.

My sense of wonder sharpened with the passing of these phenomena; but I could form no conclusion as to their origin. My knowledge of natural science, which was far from extensive, seemed to afford no plausible clue. I felt, with a wild thrilling, half-fearful, half-exultant, that the thing I had witnessed was not to be found in the catalogues compiled by human observers.

The visitation, whatever it was, had left me in a state of profound nervous excitement. Sleep, when it came, was intermittent; and the problematic light, perfume and melody recurred again and again with my dreams with a singular vividness, as if they had stamped themselves upon my brain with more than the force of normal sensory impressions.

I awoke at earliest dawn, filled with a well-nigh feverish conviction that I must visit the eastern hill immediately and learn if any tangible sign had been left by the agency of the turning beams. After a hasty and half-eaten breakfast, I made the ascent, armed with my drawing-pad and pencils. It was a short climb among overbetling boulders, sturdy tamaracks, and dwarf oaks that took the form of low-growing bushes.

The hill-top itself comprised an area of several hundred yards, roughly elliptic. It fell gently away toward the east, and ended on two sides in sheerly riven cliffs and jagged scarps. There were patches of soil amid the enormous granite folds and outcroppings; but these patches were bare, except for a few alpine flowers and grasses; and the place was given mainly to a number of gnarled and massive junipers, which had rooted themselves by preference in the solid rock. From the beginning, it had been one of my favorite haunts. I had made many sketches of the mightily mortised junipers, some of which, I verily believe, were more ancient than the famed sequoias, or the cedars of Lebanon.

● Surveying the scene with eager eyes in the cloudless morning light, I saw nothing untoward at first. As usual, there were deer-tracks in the basins of friable soil; but apart from these, and my own former footprints, there was no token of any visitor. Somewhat disappointed, I began to think that the luminous, turning wheel had been far-off in space, beyond the hill.

Then, wandering on toward the lower levels of the crest, I found, in a sheltered spot, the thing that had previously been hidden from my view by the trees and outcroppings.

It was a cairn of granite fragments—but a cairn such as I had never beheld in all my mountain explorations. Built in the unmistakable form of a star with five blunt angles, it rose waist-high from the middle of a plot of intersifting loam and sand. About it grew a few plants of mountain phlox. On one side were the charred remnants of a tree that had been destroyed by lightning in recent years. On two other sides, forming a right angle, were high walls to which several junipers clung like coiling dragons with tenacious claws embedded in the riven rock.

On the summit of the strange pile, in the center, I perceived a pale and coldly shining stone with star-like points that duplicated and followed the five angles. This stone, I thought, had been shaped by artificial means. I did not recognize its material; and I felt sure that it was nothing native to the region.

I felt the elation of a discoverer, deeming that I had stumbled on the proof of some alien mystery. The cairn, whatever its purpose, whoever its builders, had been reared during the night; for I had visited this very spot on the previous afternoon, a little before sunset, and would have seen the structure if it had been there at that time.

Somehow, I dismissed immediately and forever all idea of human agency. There occurred to me the bizarre thought that voyagers from some foreign world had paused on the hill and had left that enigmatic pile as a sign of their visit. In this manner, the queer nocturnal

manifestations were accounted for, even if not fully explained.

Arrested by the weird enigma of it all, I had paused on the verge of the loamy basin, at a distance of perhaps twelve feet from the cairn itself. Now, my brain on fire with fantastical surmise, I stepped forward to examine the cairn more closely. To my utter dumfoundment, it appeared to recede before me, preserving the same interval, as I went toward it. Pace after pace I took, but the ground flowed forward beneath me like a treadmill; my moving feet descended in their former tracks; and I was unable to make the least progress toward the goal that was apparently so near at hand! My movements were in no sense impeded, but I felt a growing giddiness, that soon verged upon nausea.

My disconcertment can more readily be imagined than expressed. It seemed obvious that either I or nature had gone suddenly mad. The thing was absurd, impossible—it belied the most elementary laws of dimension. By some incalculable means, a new and arcanic property had been introduced into the space about the cairn.

To test further the presence of this hypothetical property, I abandoned my effort at direct approach, and began to circle the basin, resuming the attempt from other angles. The pile, I found, was equally unapproachable from all sides: at a distance of twelve feet, the soil began its uncanny treadmill movement when I tried to encroach upon it. The cairn, to all intents and purposes, might have been a million miles away, in the gulf between the worlds!

After a while, I gave up my weird and futile experiments, and sat down beneath one of the overhanging junipers. The mystery maddened me, it induced a sort of mental vertigo as I pondered it. But also, it brought into the familiar order of things the exhilaration of a novel and perhaps supernatural element. It spoke of the veiled infinitudes I had vainly longed to explore; it goaded my feverish fantasy to ungovernable flights.

Recalling myself from such conjectures, I studied with sedulous care the stellar pile and the soil around it. Surely the beings who had built it would have left their footprints. However, there were no discernible marks of any kind; and I could learn nothing from the arrangement of the stones, which had been piled with impeccable neatness and symmetry. I was still baffled by the five-pointed object on the summit, for I could recall no terrene mineral that resembled its substance very closely. It was too opaque for moonstone or crystal, too lucid and brilliant for alabaster.

Meanwhile, as I continued to sit there, I was visited by an evanescent whiff of the spicy perfume that had flooded my cabin on the previous night. It came and went like a dying phantom, and I was never quite sure of its presence.

At length I roused myself and made a thorough search of the hill-top, to learn if any other trace had been left by the problematic visitors. In one of the sandy patches of soil, near the northern verge, I saw a curious indentation, like the slender, three-toed footmark of some impossibly gigantic bird.

Close at hand was the small hollow from which a loose fragment of stone, doubtless employed in the building of the cairn, had been removed. The three-pointed mark was very faint, as if the maker had trodden there with an airy lightness. But apart from the finding of this doubtful vestige, my search was wholly without result.

CHAPTER II
The Mystery Deepens

During the weeks that ensued, the unearthly riddle upon which I had fallen preoccupied me almost to the point of mania. Perhaps, if there had been anyone with whom I could have discussed it, anyone who could have thrown upon it the calm and sober light of technical knowledge, I might have rid myself of the obsession to some extent. But I was entirely alone; and, to the best of my belief, the neighborhood of the cairn was visited by no other human being at that time.

On several occasions, I renewed my efforts to approach the cairn; but the unheard-of, incredible property of a concealed *extension*, a treadmill *flowing*, still inhered in the space about it, as if established there to guard it from all intrusion. Faced with this abrogation of known geometry, I felt the delirious horror of one for whom the infinite has declared its yawning gulf amid the supposed solidity of finite things.

I made a pencil drawing of the long, light footmark before it was erased by the Sierran winds; and from that one vestige, like a paleontologist who builds up some prediluvian monster from a single bone, I tried to reconstruct in my imagination the being that had left it there. The cairn itself was the theme of numerous sketches; and I believed that I formed and debated in turn almost every conceivable theory as to its purpose and the identity of its builders.

Was it a monument that marked the grave of some intercosmic voyager from Algol or Aldebaran? Had it been reared as a token of discovery and possession by a Columbus of Achernar, landing on our planet? Did it indicate the site of a mysterious cache, to which the makers would return at some future time? Was it a landmark between dimensions? a hieroglyphic milepost? a signal for the guidance of other travelers who might pass among the worlds, going from deep to deep?

All conjectures were equally valid—and worthless. Before the wildering mystery of it all, my human ignorance drove me to veritable frenzy.

A fortnight had gone by, and the midsummer month was drawing to its close, when I began to notice certain new phenomena. I have mentioned, I think, that there were a few tiny patches of alpine phlox within the circle of occultly altered space around the cairn. One day, with a startlement that amounted to actual shock, I saw that an extraordinary change had occurred in their pale blossoms. The petals had doubled in number, they were now of abnormal size and heaviness, and were tinged with ardent purple and lambent ruby. Perhaps the change had been going on for some time without my perception; perhaps it had developed overnight. At any rate, the modest little flowers had taken on the splendor of asphodels from some mythologic land!

Beyond all mortal trespass, they flamed in that enchanted area, moated with unseen immensities. Day after day I returned, smitten with the awe of one who witnesses a miracle, and saw them there, ever larger and brighter, as if they were fed by other elements than the known air and earth.

Then, presently, in the berries of a great juniper bough that overhung the ring, I perceived a corresponding change. The tiny, dull-blue globes had enlarged enormously, and were colored with a lucent crimson, like the fiery apples of some exotic paradise. At the same time,

the foliage of the bough brightened to a tropic verdancy. But on the main portion of the tree, outside the cryptic circle, the leaves and berries were unaltered.

It was as if something of another world had been intercalated with ours. . . . More and more, I began to feel that the star of lucent, nameless stone that topped the cairn was in some manner the source or key of these unique phenomena. But I could prove nothing, could learn nothing. I could feel sure of only one thing: I was witnessing the action of forces that had never intruded heretofore upon human observation. These forces were obedient to their own laws—which, it appeared, were not altogether synonymous with the laws that man in his presumption has laid down for the workings of nature. The meaning of it all was a secret told in some alien, keyless cipher.

● I have forgotten the exact date of those final occurrences, in whose aftermath I was carried beyond the imaginable confines of time and space. Indeed, it seems to me that it would be impossible to date them in terms of terrene chronology. Sometimes I feel that they belong only to the cycles of another world; sometimes, that they never happened; sometimes, that they are still happening—or yet to happen.

I remember, though, that there was a half-moon above the crags and firs on that fatal evening. The air had turned sharp with a prescience of the coming autumn, and I had closed the door and windows and had kindled a fire of dead juniper-wood that was perfuming the cabin with its subtle incense. I heard the soughing of a wind in the higher hemlocks, as I sat before my table, looking over the recent sketches I had made of the cairn and its surroundings, and wondering for perhaps the millionth time if I, or anyone, would ever solve the unearthly riddle.

This time, I began to hear the faint, aerial music, as if in the inmost convolutions of my brain, before I caught the mystic odor. At first, it was little more than the memory of a sound; but it seemed to rise and flow and pour *outward*, slowly, tortuously, as if through the windings of some immeasurable conch, till it was all about me with its labyrinthine murmuring. The cabin—the world outside—the very heavens—were filled with tenuous horns and flutes that told the incommunicable dreams of a lost elfland.

Then, above the redolence of the clearly burning, smokeless wood, I smelt that other perfume, rich and ethereal, and no less pervasive than on the former occasion. It seemed that the closed doors and windows were no barrier to its advent: it came as if through another medium than the air, another avenue than the space in which we move and have our being.

In a fever of exalted wonder and curiosity, I threw the door open and went out into the sea of unearthly fragrance and melody that overflowed the world. On the eastern hill, as I had expected, the turning wheel of light was slowing in a stationary position beyond the tower-like junipers. The rays were soft and hueless, as before, but their luster was not diminished by the moon.

This time, I felt an imperative desire to solve the enigma of that visitation: a desire that drew me, stumbling and racing upward among the craggy boulders and low-grown bushes. The music ebbed to a far, faint whisper, the wheel revolved more gradually, as I neared the summit.

A rudiment of that caution which humanity has always felt in the presence of unknown things, impelled me to slacken my reckless pace. Several immense trees and granite outcroppings, however, still intervened betwixt myself and the source of those trembling beams. I stole forward, seeing with an inexpressible thrill, as of some mystic confirmation, that the beams emanated from the site of the stellform cairn.

It was an easy matter to climb the massive folds of rock and reach a vantage from which I could look directly down on that mysterious area. Crawling flat on my stomach, in a line with the mightiest of the overjutting junipers, I attained my objective, and could peer from behind a heavy bough that grew horizontally along the rock, at the wall's edge.

The loamy basin in which the cairn had been reared was beneath me. Poised in mid-air, level and motionless, and a little to one side of the cairn, there hung a singular vessel that I can liken only to a great open barge with upward-curving prow and stern. In its center, above the bulwarks, arose a short mast or slender pillar, topped with a fiery, dazzling disk from which the wheel of beams, as if from a hub, poured vertically and transversely. The whole vessel was made of some highly translucent material, for I could see the dim outlines of the landscape beyond it; and the beams poured earthward through its bottom with little diminution of their radiance. The disk, as well as I could tell from the sharply foreshortened position in which I viewed the barge, was the only semblance of mechanism.

It was as if a crescent moon of milky crystal had come down to flood that shadowy nook with its alien light. And the prow of this moon was no more than six or seven feet from the granite wall that formed my place of vantage!

Four beings, whom I can compare to no earthly creatures, were hovering in the air about the cairn, without wings or other palpable support, as if they, like the barge, were independent of terrene gravity. Though little less in stature than men, their whole aspect was slight and imponderable to a degree that is found only in birds or insects. Their bodily plasm was almost diaphanous, with its intricate nerves and veinings dimly visible, like iridescent threads through a gauzy fabric of pearl and faint rose.

One of them, hanging aloft before the wheel of beams, with his head averted from my view, was holding in his long, frail hands the cold and lucent star that had topped the cairn. The others, stooping airily, were lifting and throwing aside the fragments that had been piled with such impeccable symmetry.

The faces of two were wholly hidden; but the third presented a strange profile, slightly resembling the beak and eye of an owl beneath an earless cranium that rose to a lofty ridge aigretted with nodding tassels like the topknots of quail.

The tearing-down of the pile was accomplished with remarkable deftness and speed; and it seemed that the pipy arms of these creatures were far stronger than one would have imagined. During the process of demolition, they stooped lower and lower, till they floated almost horizontally, just above the ground. Soon all the fragments were removed; and the entities began to scoop away with their fingers the soil beneath, whose looseness appeared to evince a previous digging at some recent date.

● Breathless and awed before the cryptic vision, I bent forward from my eyrie, wondering what inconceivable treasure, what cache of unguessed glory and mystery, was about to be exhumed by these otherworld explorers.

Finally, from the deep hollow they had made in the loamy soil, one of the beings withdrew his hand, holding aloft a small and colorless object. Apparently it was the thing for which they had been searching, for the creatures abandoned their delving, and all four of them swam upward toward the barge as if wafted by invisible wings. Two of them took their stations in the rear part of the vessel, standing behind the mast-like pillar and its wheel of rays. The one who bore the shining, star-shaped stone, and the carrier of the dull, unknown object, posted themselves in the prow, at a distance of no more than nine or ten feet from the crag on which I crouched.

For the first time, I beheld their faces in front view, peering straight toward me with glowing, pale-gold eyes of inscrutable strangeness. Whether or not they saw me, I have never been sure: they seemed to gaze through me and beyond—illimitably beyond—into occulted gulfs, and upon worlds forever sealed to the sight of man.

I discerned more clearly now, in the fingers of the foremost being, the nameless object they had dug from beneath the dismantled cairn. It was smooth, drab, oval, and about the size of a falcon's egg. I might have deemed it no more than a common pebble, aside from one peculiar circumstance: a crack in the larger end, from which issued several short, luminous filaments. Somehow, the thing reminded me of a riven seed with sprouting roots.

Heedless of any possible peril, I had risen to my feet and was staring raptly at the barge and its occupants. After a few moments, I became aware that the wheel of beams had begun to turn gradually, as if in response to an unperceived mechanism. At the same time, I heard the eerie whispering of a million flutes, I breathed a rushing gale of Edenic spices. Faster and faster the rays revolved, sweeping the ground and the air with their phantom spokes, till I saw only a spinning moon that divided the crescent vessel and seemed to cleave asunder the very earth and rocks.

My senses reeled with the dizzy radiance, the ever-pouring music and perfume. An indescribable sickness mounted through all my being, the solid granite seemed to turn and pitch under my feet like a drunken world, and the heavily buttressed junipers tossed about me against the overturning heavens.

Very swiftly, the wheel, the vessel and its occupants took on a filmy dimness, fading in a manner that is hard to convey, as if, without apparent diminishment of perspective, they were receding into some ultra-geometric space. Their outlines were still before me—and yet they were immeasurably distant. Coincidentally, I felt a terrific suction, an unseen current more powerful than cataracting waters, that seized me as I stood leaning forward from the rock, and swept me past the violently threshing boughs.

I did not fall toward the ground beneath—for there was no longer any ground. With the sensation of being wrenched asunder in the ruin of worlds that had returned to chaos, I plunged into grey and frigid space, that included neither air, earth, stars nor heaven; void, uncreated space, through which the phantom crescent of the strange vessel fell away beneath me, bearing a ghostly moon.

As well as I can recollect, there was no total loss of consciousness at any time during my fall; but, toward the end, there was an increasing numbness, a great dubiety, and a dim perception of enormous arabesques of color that had risen before me, as if created from the grey nothing.

All was misty and two-dimensional, as if this new-made world had not yet acquired the attribute of depth. I seemed to pass obliquely over painted labyrinths. At length, amid soft opals and azures, I came to a winding area of rosy light, and settled into it till the rosiness was all about me.

My numbness gave way to a sharp and painful tingling as of frostbite, accompanied by a revival of all my senses. I felt a firm grasp about my shoulders, and knew that my head and upper body had emerged from the rosiness.

CHAPTER III

The Infinite World

● For an instant, I thought that I was leaning horizontally from a slowly plunging cataract of some occult element, neither water, air nor flame, but somehow analagous to all three. It was more tangible than air, but there was no feeling of wetness; it flowed with the soft fluttering of fire, but it did not burn.

Two of the strange, ethereal entities were drawing me out on a luminous golden cliff, from which an airy vegetation, hued as with the rainbows of towering fountains, projected its lightly arching masses into a gold-green abyss. The crescent barge and its wheel of beams, now stationary, were hovering close at hand in a semi-capsized position. Further away, beyond the delicate trees, I saw the jutting of horizontal towers. Five suns, drowning in their own glory, were suspended at wide intervals in the gulf.

I wondered at the weird inversion of gravity that my position evinced; and then, as if through a normalizing of equilibrium, I saw that the great cliff was really a level plain, and the cataract a gentle stream.

Now I was standing on the shore, with the people of the barge beside me. They were no longer supporting me with their frail, firm hands. I could not guess their attitude, and my brain awoke with a keen electric shock to the eerie terror and wildering strangeness of it all. Surely the world about me was no part of the known cosmos! The very soil beneath me thrilled and throbbed with unnameable energies. All things, it seemed, were composed of a range of elements nearer to pure force than to common matter. The trees were like fountains of supernal pyrotechnics, arrested and made permanent in mid-air. The structures that soared at far intervals, like celestial minarets, were built as of moulded morning cloud and luminescence. I breathed an air that was more intoxicating than the air of alpine heights.

Out of this world of marvel, I saw the gathering of many people similar to the entities beside me. Amid the trees and towers, from the shimmering vistas, they came as if summoned by magic. Their movements were swift and silent as the gliding of phantoms, and they seemed to tread the air rather than the ground. I could not hear even the least whispering among them, but I had the feeling of inaudible converse all about me—the vibrant thrilling of overtones too high for the human ear.

Their eyes of pale gold regarded me with unsearchable intentness. I noted their softly curving mouths, which ap-

peared to express an alien sadness, but perhaps were not sad at all. Beneath their gaze, I felt a queer embarrassment, followed quickly by something that I can describe only as an inward illumination. This illumination did not seem to be telepathic: it was merely as if my mind had acquired, as a concomitant of the new existence into which I had fallen, a higher faculty of comprehension impossible in its normal state. This faculty was something that I drew in from the strange soil and air, the presence of the strange multitude. Even then, my understanding was only partial, and I knew there was much that still eluded me through certain insuperable limitations of my brain.

The beings, I thought, were benignantly disposed, but were somewhat puzzled as to what should be done with me. Inadvertently, in a way without parallel, I had trespassed upon another cosmos than my own. Caught in the pull of some transdimensional vortex wrought by the crescent vessel as it departed from earth, I had followed the vessel to its own world, which adjoined ours in transcendental space.

This much I understood, but the mechanics of my entrance into the supernal realm were somewhat obscure to me. Apparently my fall into the rosy river had been providential, for the stream had revived me with its supersaqueous element, and had perhaps served to prevent a sort of frostbite that would otherwise have been incurred by my plunge through an interspatial vacuum.

The purpose of the granite cairn, and the visits made by its builders to earth, were things that I could apprehend but dimly. Something had been planted beneath the cairn, and had been left there for a stated interval, as if to absorb from the grosser mundane soil certain elements or virtues lacking in the soil of this ethereal world. The whole process was based on the findings of an arcanic but severely ordered science; and the experiment was one that had been made before. The lucent stone on the cairn, in some way that I could not grasp, had established around it the guarding zone of fluent treadmill space, on which no earthly denizen could intrude. The unearthly changes of the vegetation within this zone were due to certain mystic emanations from the planted seed.

The nature of the seed eluded me; but I knew that it possessed an enormous and vital importance. And the time for its transplanting to the otherworld soil was now at hand. My eyes were drawn to the fingers of the entity who carried it, and I saw that the seed had swollen visibly, that the shining rootlets had lengthened from its riven end.

More and more of the people had gathered, lining the shore of that rosy river, and the intervals of the airy boskage, in a silent multitude. Some, I perceived, were thin and languid as wasting specters; and their bodily plasm, as if clouded by illness, was dull and opaque, or displayed unhealthy mottlings of shadow amid the semitranslucence that was plainly a normal attribute.

In a clear area, beside the hovering vessel, a hole had been dug in that Edenic soil. Amid the bewildering flux of my impressions, I had not noticed it heretofore. Now it assumed a momentous import, as the bearer of the seed went forward to deposit his charge in that shallow pit, and bury it with a curious oval spade of crystalline metal beneath the golden element that was like a mixture of loam and sunset glory.

The crowd had drawn back, leaving a vacant field about the planted seed. There was a sense of awful and solemn, ceremonial expectation in the stillness of that waiting people. Dim, sublime, ungraspable images hovered upon the horizon of my thought like unborn suns; and I trembled with the nearness of some tremendous thaumaturgy. But the purpose of it all was still beyond my comprehension.

Darkly I felt the anticipation of the alien throng. . . . and somewhere—in myself or in those about me—a great need and a crying hunger that I could not name.

It seemed that whole months and seasons went by; that the five suns revolved above us in altered ecliptics, ere the end of the interim of waiting. . . . But time and its passing were perhaps obedient to unknown laws, like all else in that other sphere, and were not as the hours and seasons of earthly time.

There came at last the awaited miracle: the pushing of a pale shoot from the golden sod. Visibly, dynamically it grew, as if fed with the sap of accelerating years that had turned to mere minutes. From it, there burst a multitude of scions, budding in their turn with irised leafage. The thing was a fountain of unsealed glories, an upward-rushing geyser of emerald and opal that took the form of a tree.

The rate of growth was beyond belief, it was like a legerdemain of gods. From moment to moment the boughs multiplied and lengthened with the leaping of wind-wrought flames. The foliage spread like a blown spray of jewels. The plant became colossal, it towered with a pillar-thick stem, and its leafage meshed the five suns, and drooped down toward the river and above the barge, the crowd, and the lesser vegetation.

Still the tree grew, and its boughs came down in glorious arches and festoons, laden with starlike blossoms. I beheld the faces of those about me in a soft umbrage, along arboreal arcades, as if beneath some paradisical banyan. Then, as the festoons hung nearer, I saw the fruiting of the tree: the small globules, formed as of blood and light, that were left by the sudden withering of the starry blossoms. Swiftly they swelled, attaining the size of pears, and descending till they grew well within my reach—and within the reach of that embowered throng.

It seemed that the marvellous growth had attained its culmination, and was now quiescent. We were domed as if by some fabulous Tree of Life that had sprung from the mated energies of Earth and the celestial Otherworld.

Suddenly I knew the purpose of it all, when I saw that some of the people about me were plucking and devouring the fruit. Many others abstained, however, and I perceived that the sanguine-colored pears were eaten only by the languid, sickly beings I have mentioned before. It seemed that the fruit was a sovereign curative for their illness: even as they devoured it, their bodies brightened, the mottlings of shadow disappeared, and they began to assume the normal aspect of their fellows.

I watched them—and upon me there came a kindred hunger, a profound and mystic craving, together with the reckless vertigo of one who is lost in a world too far and high for human tread. There were doubts that woke within me, but I forgot them even as they woke. There were hands that reached out as if to warn and restrain me, but I disregarded them. One of the luscious, glowing pears hung close before me—and I plucked it.

The thing filled my fingers with a sharp, electric tin-

gling, followed by a coolness that I can compare only to snow beneath a summer sun. It was not formed of anything that we know as matter—and yet it was firm and solid to the touch, and it yielded a winy juice, an ambrosial pulp, between my teeth. I devoured it avidly, and a high, divine elation coursed like a golden lightning through all my nerves and fibers.

I have forgotten much of the delirium (if delirium it was) that ensued. . . . There were things too vast for memory to retain. And much that I remember could be told only in the language of Olympus.

I recall, however, the colossal expansion of all my senses, the flowering of thought into stars and worlds, as if my consciousness had towered above its mortal tenement with more than the thaumaturgic spreading of the Tree. It seemed that the life of the strange people had become a province of my being, that I knew from all time the arcana of their wisdom, the preterhuman scale of their raptures and sorrows, of their triumphs and disasters.

Holding all this as an appanage, I rose into spheres ulterior and superior. Infinities were laid before me, I conned them as one cons an unrolled map. I peered down upon the utmost heavens, and the hells that lie contiguous to the heavens; and I saw the perennial process of their fiery transmutation and interchange.

I possessed a million eyes and ears; my nerves were lengthened into nether gulfs, were spun out beyond the suns. I was the master of strange senses, that were posted to oversee the activities of unlit stars and blind planets.

All this I beheld and comprehended with the exultation of a drunken demiurge; and all was familiar to me, as if I had seen it in other cycles.

Then, quickly and terribly, there came the sense of division, the feeling that part of myself no longer shared this empire of cosmic immensitude and glory. My delirium shrank like a broken bubble, and I seemed to lose and leave behind me the colossal, shadowy god that still towered above the stars. I was standing again beneath the Tree, with the transdimensional people about me, and the ruddy fruit still burning in the far-flung arches of leafage.

Here, also, the inexorable doom of division pursued me, and I was no longer one, but *two*. Distinctly I saw myself, my body and features touched with the ethereal radiance of the beings who were native to that world; but *I*, who beheld that *alter ego*, was aware of a dark and iron weight, as if some grosser gravity had claimed me. It seemed that the golden soil was yielding under me like a floor of sunset cloud, and I was plunging and falling through nether emptiness, while that other self remained beneath the Tree.

I awoke with the sultry beams of the midday sun upon my face. The loamy ground on which I lay, the scattered fragments of the cairn beside me, and the rocks and junipers, were irrecognizable as if they had belonged to some other planet than ours. I could not remember them for a long while; and the things I have detailed in this narrative came back to me very tardily, in a broken and disordered sequence.

The manner of my return to Earth is still a mystery. Sometimes I think that the supernal people brought me back in that shining vessel whose mechanism I have never understood. Sometimes, when the madness is upon me, I think that I—or part of myself—was precipitated hither as an aftermath of the eating of the Fruit. The energies to whose operation I exposed myself by that act were wholly incalculable. Perhaps, in accord with the laws of a transdimensional chemistry, there was a partial revibration, and an actual separation of the elements of my body, by which I became two persons, in different worlds. No doubt the physicists will laugh at such ideas. . . .

There were no corporeal ill effects from my experience, apart from a minor degree of what appeared to be frostbite, and a curious burning of the skin, mild rather than severe, that might have resulted from a temporary exposure to radioactive matters. But in all other senses, I was, and still am, a mere remnant of my former self. . . . Among other things, I soon found that my artistic abilities had deserted me; and they have not returned after an interim of months. Some higher essence, it would seem, has departed wholly and forever.

I have become as it were, a clod. But often, to that clod, the infinite spheres descend in their terror and marvel. I have left the lonely Sierras and have sought the refuge of human nearness. But the streets yawn with uncharted abysms, and Powers unsuspected by others move for me amid the crowd. Sometimes I am no longer here among my fellows, but am standing with the eaters of the fruit, beneath the Tree, in that mystic otherworld.

THE END

Wrong This Time!

We stand corrected, readers! This time we were wrong. When after careful consideration of economic conditions, and what we believed to be the wishes of our readers we changed the price of WONDER STORIES to 15c, with a smaller number of pages, we thought we were making a wise and just move.

Events have proved that we were wrong! We are glad, even proud to admit that. Our readers demand the 25c size, with the usual number of pages, 96, and the usual number of stories, five or six in each issue.

This number, therefore, is our surrender. We are glad to know that even the Depression will not stop our readers from wanting and demanding science fiction. Beginning with this issue we return to the 25c, 96 page, magazine; and as a good measure have included an unusual number of good stories, the best we could get.

The great number of demands for the return to the old size have been answered. We acknowledge freely our error. We hope it won't happen again!

THE PUBLISHERS

(Illustration by Paul)

They saw the slumped figure of Dr. Jan Friede. Before him was the electric integraph. Scattered around were many sheets of paper with mysterious equations.

THE FATAL EQUATION

By ARTHUR G. STANGLAND

● Plato once said that our lives are like the flickering shadows of events cast upon cavern walls. We no more experience reality than a fly does. As it crawls across a wall it sees specks on the wall, it cannot see or know the wall as a whole.

According to our author we are imprisoned in little cells limited by time and space. Only if we were released from this imprisonment could we know what Reality is. How can we escape, our author asks? For this answer he goes to mathematics—not in a dry lecture but in a scientific detective story filled with the aroma of murder, as strange and bizarre as man could conceive.

● "But listen, George," pleaded the voice on the other end, "it's the damndest tangle of calculus and physics and murder you've ever seen. It's all just a crazy jumble to me—sheets and sheets of 'math' all over the desk in front of him and also one of those integraph machines. He's sitting there like a guy gone to sleep in his chair. You've got to come out and give me a hand—how do I know it's murder? Because Dr. Friede is too young and healthy a man to die from heart attack, and—don't laugh: there's something in the atmosphere here that just 'smells' of murder. In other words, it all looks pretty fishy, but what part of it is fishy is for you to find out. Will you come?"

It was a tired, wan-faced George Funkhouser who answered: "Yes, I'll come, Kip, but you certainly don't give me any rest, do you? I just got in from the East. See you in a few minutes."

In ten minutes George was fully refreshed from a shower and a change of clean clothes. All sign of sleep had vanished from his intense brown eyes. If the nervous energy pulsing in his lean form drove him to long hours at hard work, it likewise drove him to long hours of hard play, for George Funkhouser never took half measures in anything. A new light was glowing in his sensitive emotional face. Being friend to Kip had not been without its exciting moments, for the police detective had long since recognized a valuable counterpart in the shrewd young mathematician.

As he sped out along the main boulevard toward Mt. Tabor, Funkhouser mulled over the surprising news. He didn't know Dr. Jan Friede personally, but he did know that he was one of the foremost mathematical physicists in the country. He had no known enemies, was not a man of wealth, and preferred to live in quiet simplicity. Maybe Kip was just imagining things. Still there was the matter of his hunch, despite the hilarious absurdity of a hunch lodging in him of all people for he ordinarily pooh-poohed others of finer sensibilities.

Friede's residence was a two-story English manor style of house, and as Funkhouser drew up to it, it was a blaze of lights. He returned the familiar greeting of the officer at the door and then entered.

"Well, Old Man Punctuality himself!"

Coming toward him was a man dressed in a dull gray suit. He was one big grin, so that his deep set eyes almost disappeared in the transformation. He shot out a strong capable looking hand which George grasped with genuine affection. Kip led the way upstairs.

"Friede's study is upstairs," he was saying, "and I've left everything just as we found it. The coroner is still here waiting for you."

They entered a room lined with shelves of books and old tapestries. French windows opened upon a little balcony, but at the moment they were closed and curtained. It was a softly quiet room, the respectful stillness of death cloaking it, for in the middle of it all George saw the slumped figure of Dr. Jan Friede in a chair. Before him on a desk was an electric integraph, a complicated machine with numerous keys and lever bars for solving intricate equations of the calculus.

Scattered around it were many sheets of paper covered with mysterious looking strings of abstruse equations—the hieroglyphic language of the physicist. George stood opposite the dead man, looking at him across the desk. A man drowsing in his library could not have looked more natural. The eyes were almost closed. The smooth, half youthful face was relaxed in peace. The slender hands had dropped into his lap.

George turned to the coroner. "What did you find out, Dr. Bauer?"

"Well, it's a strange thing to say for a man Dr. Friede's age—he's only about forty—but his heart just stopped working, that's all. A natural death is my opinion."

Dr. Bauer began packing away his instruments in leather cases with deft, expert movements. He was a small man, keenly alive to life.

"Find anything else?"

"No. I took a careful look with the X-ray and penetrating-spectroscope, thinking I might find poison in his system, but he's okay in that respect."

"I see. All right, doctor, that's all I want to know."

Attendants removed the body now in charge of Dr. Bauer. George began inspecting the various sheets of calculations scattered over the desk as soon as the coroner was gone.

"Have you made photostats of these yet?" he asked.

"No, but I had the photographer take pictures of the room as is, though."

"Better get him to take photostats of these sheets of equations and especially this last one that he apparently was working on when he died which he calls "20b."

● Kip nodded. That was a precaution he had overlooked.

"By the way, George, I'm waiting for a call from Murphey. I sent him over on Division street where Friede's secretary lives. He might be able to tell us something interesting."

"His secretary, eh! What's his name?"

"Lonsdale."

"Know much about him?"

"Just what I learned from Friede's housekeeper, Mrs. James. I'll have her brought up for you."

The young mathematician's dark eyes lighted up like a blood-hound's upon finding fresh trail. An officer brought in the poor frightened soul. Funkhouser smothered a grin. The woman presented herself in helpless agitation, ravelling and unravelling her apron over a rotund mid-section. Her hair was pyramided in diminishing doughnuts flat atop her head. Her light colored eyes stared wide behind silver-rimmed spectacles, and as she walked she planted her feet solidly, almost ponderously.

"Did Mrs. James find Dr. Friede?" asked Funkhouser, turning to Kip.

"Oh, er—er yes, sir, I did!" answered the woman quickly. "It was about 'alf past five, sir, when I come up with 'is tea—and 'im a-sittin' there—dead!"

"Well, Mrs. James," interrupted George, "what I really want you to do is tell me what you know of the doctor's secretary."

"Oh—Mr. Lonsdale? I cahn't tell you much, sir. 'E always seemed such a nice young gentleman to me. 'E doesn't stay 'ere but comes in of a mornin' to 'elp Dr. Friede. This mornin' 'e left around noon an' I 'eard the doctor s'y somethin' about 'im comin' back this evenin'."

George looked at Kip significantly.

"All right, Mrs. James, that's all." When she had gone, George looked at Kip. "Somehow or other Lonsdale is mixed up in this, Kip."

"How?"

"I don't know, but it's just as you said: there's something fishy here. Friede's death appears almost too natural. It's a rigamarole all right."

George turned to delving into various drawers of Friede's desk, glancing perfunctorily through numerous letters and papers. Presently, he found a thick black book. It was a personal journal or diary in a distinctive, individual hand. He sat down in a chair and began to read through it. Mainly, it consisted of the famous scientist's thoughts and ideas for mathematical treatises. The last several entries proved most interesting.

"March 25th . . . . . And what of our Universe? Must we always go on groping blindly, being content after all with the mere 'shadows on our cave walls,' as Plato is constrained to observe? The earlier 20th century trend of thought was a mixture of a mechanical and an ever-increasing or expanding Universe, somewhat of the nature of a soap bubble. But I wonder if after all we cannot throw our Theory of Quanta to the winds with its negation of causation, and assume—logically enough—that the Beginning rests in a Mathematical Mind?

"I shall even go a step further and suggest that pure thought is the 'real essence of substance,' for although we still do not know the true nature of light, we can express its reality in objective equations. The same with the electron—we can still express its attributes of behavior in formulae regardless of whether it is a ring of Heisenberg's 'probability waves' or not. I think it would be startling to investigate this idea mathematically. Had a discussion with MacMillan, but he pooh-pooh's the whole idea—the old chauvinistic diehard!

"April 4th. I have been wandering off into weird realms of hyper-mathematics lately. And as a result it is being profoundly impressed upon me that what we are dealing with in mathematical physics as 'realities' are but the shadows of the real truths projected from higher dimensions into our realm of length, breadth and thickness. A beetle seeing no farther than his two dimensions might ponder upon the probabilities of sporadic wet spots on the ground, while we, extending up into a third dimension, would be able to predict with certainty the coming of rain, having such necessary data at our hands.

"Almost inexorably it seems, Time is welded upon our three dimensions as a fourth dimension. In our progress through space, Time is always the ordinate and Space is the abcissa. To me it appears that Time, as we understand the experience of the phenomenon, is but a mechanism for contacting our imperfect consciousness with a part of the whole at consecutive intervals, just as a revolving wheel is in contact with the road at only one point. It seems to be merely a difference between a concept of dynamic Time and static Time. Could we but discard Time, I wonder if the whole panorama of life would unfold before our eyes along the world-line of the abcissa axis? And then might we not come face to face with Ultimate Reality!

"April 12th. I almost tremble as I write here. I am on the verge of a vast discovery of a magnitude that matches all space. Starting with a tensor borrowed from an Einsteinian-Reimann space, I have arrived at a comparatively simple mathematical statement in which Time as a function of space cancels out on both sides of the equality sign, being substituted by a static alternative. In other words, I've discarded Time altogether as a part of Space! The conclusions I am to draw from this discovery overawe me. MacMillan still is patronizing toward me though I haven't shown him my analyses yet."

● George sat in a meditative silence after laying the journal aside. Dynamic Time. . . . static Time. . . . the veils drawn across ultimate reality! What manner of sane-minded man would toy with such a ungodly fantastic idea as this? Was there really anything to his ideas? Had he actually gone blundering out to the frontiers of human consciousness and lifted a corner of the veil for a fascinated moment? Maybe his death was caused by some such unguided attempt to peer into the Beyond. Hell!

Funkhouser swore under his breath, such mental ramblings would send anyone mad—himself included. He was quite tempted to call Friede a sadly demented man and let it go at that. Yet he knew it was too easy a way out of a perplexing case. There must be some homely solution to his death, something uncontaminated by weird theories of peeking behind the curtain like some errant schoolboy.

"Well, what do you make of it?" Kip broke in upon his reflections.

He was silent a moment. "Listen, old tube, I'm a mathematician, but I'm no wizard. I have a feeling that somehow or other Friede's death is connected with his work. Why should he die just before his mathematical treatise is completed? We need help in wading through this maze of theory and hyper-mathematics, because therein lies the motive, I'm sure. Now there's only one person who can help us unravel this Gordian knot, and that's Dr. MacMillan—as fine and sane a man of mathematics as ever lived. He's from the University, and I can vouch for him because he taught me much of what I know."

"Anything you say. Call in all the technical help you need. It looks like a hopeless mess to me."

Dr. MacMillan was immediately reached by phone. After Funkhouser's explanations the professor was only too glad to be of help. He would be over right away, he said.

In a short time the venerable old professor of mathematics arrived. His white hair and slightly ponderous

figure belied his physical age, but the bright, intelligent gleam in his eyes spoke mutely of youthful reservoirs of energy.

"Hell, George," he greeted, then he paused. "My, my what a sad thing this is," he lamented, looking around the room.

"Glad to see you again, Dr. MacMillan, though it's unfortunate it has to be under such circumstances." Funkhouser turned to Kip. "Doctor, this is Detective Wagner in charge of the case."

Following the introduction, George wasted no time, launching forthright into the midst of his problem.

"I tell you, MacMillan, this man was murdered, but how, I do not know. That's why I've sent for you," explained George, picking up several sheets of Friede's computations. "Somewhere in this mass of figures lies the key to his death."

"But how are you so sure of that?" queried the older man, leaning forward with interest.

Funkhouser's eyes strayed to Kip momentarily. "Well, it's just a hunch—and yet something more."

"'Something more'?" repeated the professor, "and what do you mean by that?"

George regarded MacMillan with shrewd eyes.

"Dr. Friede passed away at his desk right in the midst of completing his amazing mathematical treatise!"

"I shouldn't call it 'amazing,' George, with all due respect to the memory of my deceased friend. Rather, it was an idea which would cause anyone to question the sanity of its creator!"

"You were intimate with Dr. Friede, MacMillan, more so than anyone else, according to his diary. Explain in ordinary terms what he was attempting to do."

After a pensive moment, the professor began: "Jan had an idea that the Universe is the product of a Mathematical Mind, that all matter right down to the infinitesimal spinning vortex of the electron is steeped in an all-pervading aura of Thought, even deriving its genesis from such a source. And every time I called on him here he elaborated on it with growing enthusiasm. At last he even conceived the idea that Time could be divorced from Matter and that all Eternity might be revealed to us up through magnificent realms of hyper-dimensions. The poor man was mad with his weird theories!"

CHAPTER II
Into the Vortex

● Slowly, George paced the floor, a puzzled frown on his face as he listened to MacMillan. He stopped in front of the electric integraph deep in thought.

"Dr. MacMillan," he declared decisively, picking up several sheets of papers, "read off those equations to me, beginning with (9a) up to (20b). I'm going to run through them the same as Friede did."

Dr. MacMillan received the sheets of equations wonderingly, looking up at George with a penetrating, questioning gaze. But the younger mathematician sat down in the same chair that Friede had used, waiting for the old professor to begin. An indefinable tension sprang up in the room like a cold wave of air. Kip stirred uneasily and then crossed to his friend.

"Listen, Funkie, I don't like this idea of yours," he complained.

"Why—what's wrong with it?" the other countered.

"Well, I don't know exactly. I just feel that all's not well—Friede died in this chair!" the detective reminded him.

"Don't be an old woman all your life, Kip. Come on, MacMillan, let's go!"

In a calm voice the professor began reading from the sheets of computations. Each equation George set up on the keyboard of the integraph. For the process of solving he was merely obliged to trip a small lever and the machine whirred into action with a clicking of many small wheels and keys, continuing so for a full minute, whereupon the answer would appear on a sheet of paper fed from a cartridge roll. Rapidly yet easily George worked out each equation, checking as accurately as a precision machine with Friede's results. At last they came to the final equation (20b). Kip stood nervously tense near Funkhouser watching every move he made with the intentness of a watchdog. Friede had died just before he solved (20b). Would George suffer the same insidious fate?

"The 'fatal equation'!" murmured Funkhouser, as MacMillan read it out.

The young mathematician sat bent over the machine, the keys clicking slowly under his fingers, weaving a mathematical pattern that had ended in a mysterious death for its creator. The intricate differential tensor at last was set up. All that remained was to trip the small metal lever that sent the machine into solving the equation. Death had struck from out of the unknown just before that operation. Every eye in the room was on Funkhouser. He put out a hand and tripped the starting lever. Nothing startling happened. The machine whirred softly, clucking inside its magnificently accurate metal brain. An audible sigh of relief automatically escaped everyone.

Suddenly a telephone buzzed quietly on the table, startling the tensed onlookers. It was Kip who answered in a harsh voice.

"Oh, you Murphey. What's that—Lonsdale hasn't been there all day! All right, stay right there. We'll be over in half a shake!"

Kip glanced down at Funkhouser. "So, he's skipped out on us, eh. He's the guy we want. Say, once I lay hands on a picture of him, we'll have every patrol car on the lookout for him."

"Don't be too optimistic," warned Funkhouser. "Apprehending Lonsdale won't settle the case. We still haven't proved it's murder. The most we can hope for is some clue to establish that it is murder."

"Dr. MacMillan, can you give us anything of a descriptive nature that will aid us in picking up Lonsdale?"

"Why, that's a strange thing to hear of his disappearance," murmured the old professor, "seems to me there must be some explanation for it. As to a description of him, I must confess there's nothing very distinctive about his person. He is a medium-sized man about one hundred fifty pounds in weight, has light blue eyes and light hair. He walks with a quick springy step. But the best thing would be a photograph of him."

"First of all let's get over to his apartments and search the place," suggested George, "then we might have something more definite to give police radio central. Come along, MacMillan."

There was nothing pretentious about the exterior of Lonsdale's quarters. It was an unassuming, simple edifice on a quiet street, catering only to a conservative clientele. Funkhouser's observant shrewd eyes were alive to the

locale. Through his mind was running an old saw: "As a man liveth so is he judged." Certainly Lonsdale's character was to be read in every part of his neat, clean room. Nothing was out of place, each article of furniture occupying a definite position in methodical relation to the rest of the room and its contents. His desk was a paragon of system and neatness. Here, thought Funkhouser, resides the owner of a mathematical mind.

Murphey explained how he had quizzed the janitor and several of the apartment guests only to discover that Lonsdale had not been in since morning.

While the officer held forth in ponderous exposition, George combed the room for anything of value, some clue that might give an inkling of motive to the enigmatic problem confronting them. In a dresser drawer he came upon a picture of a solemn-faced light haired young man.

"Hm." He turned to the professor. "Is this Lonsdale?"

"Yes, that's Lonsdale all right."

Kip literally pounced upon the find. "Good! Now we'll get somewhere with this search for that guy." He turned to the policeman. "Murphey, take this photograph down to the car and send it in to Max—and this written description I'm writing out. Hurry!"

● Murphey was not a hand to trace clever fugitives, but he was an expert telephotographer. Down in the patrol car he got busy with the photograph, wrapping it deftly on a revolving cylinder and focusing a small exciter beam on it. With each revolution was builded a pattern of a wanted man in police radio central, a signal which would set into operation an inexorable machine that would comb the streets of the city with the accuracy of a selective photoelectric cell.

Systematically, George went through every drawer in the room he could find, yet leaving things as he found them. Kip was more rough-shod, taking his spite out on Lonsdale objectively, by leaving clothing, papers and various personal articles where they fell on the floor. It was beginning to appear as if their search would be in vain.

Kip stood up in the middle of the mess he had left in his cyclonic fury: "Damn that guy, Funkie, he knows something or else he wouldn't have left in such a hurry. When we bring 'im in, I'll 'sweat' 'im the way my granddad used to handle 'em! None of these new-fangled mental tests."

However, George made no answer, being bent over a fresh carbon paper that he had brought forth from a desk drawer. Dr. MacMillan eyed the young mathematician with interest.

"Get a mirror, Kip," said George in a calm tone of voice that startled the detective into wondering compliance.

"What've you got there."

"It's a short note Lonsdale's written," returned the other, placing the mirror so as to read the message. "He must have kept the carbon copy on himself."

The three men read the carbon in the mirror:

> "You must be more patient, Dr. Bishop. I can't get the final equations yet; he might suspect me if I hang around too much. I've copied equations (7c) to (15a) which I enclose for you with this note. As Andre will tell you, he and I shall meet at 4 p. m. tomorrow at the usual place. Thanks for the $500."

Kip let out a snort: "There's our clue, Funkhouser! This Lonsdale guy has been copying Friede's work and selling it to a Dr. Bishop—whoever he is. This morning Friede caught 'im at it and Lonsdale killed 'im. There's the whole case in a peanut tube."

"You think so?" was George's dry retort. "How did he kill him without a visible trace of the method?"

"Well," hesitated Kip, "we'll get that out of him when he's brought in."

"Which just goes to show the case isn't solved yet. We have two more unknowns in the equation now. Who are André and Dr. Bishop?" Funkhouser looked to MacMillan. "Ever hear of them?"

"Never. André might possibly be Bishop's secretary however," offered the white-haired professor.

George was silent for a long moment, then he regarded Kip with a smile.

"I think I'll let your police force do a little work for a while now because I'm going home for a few hours sleep. If Lonsdale shows up call me there."

"All right, Funkie. What did you do with the sheets of equations?"

"I have those down in my car. I got the photostats of them also from the photographer just before we came over here."

Dr. MacMillan shifted anxiously from one foot to the other, and then took out a watch.

"Do you need me any more this evening, George? You see, I must catch a plane for 'Frisco in several hours."

"Oh, I'm sorry, MacMillan. Thanks a lot for your help."

"It wasn't much."

"Well, you never can tell."

On the way home George switched on his private televisor that the police department had assigned to his car at the request of Detective Kip Wagner. As the ground glass screen came to life, a familiar picture was being shown—that of Lonsdale. A voice was saying:

"Attention all patrol units: this is a picture of a man named Anson Lonsdale, wanted in connection with the mysterious death of Dr. Jan Friede. He is blue-eyed, blonde, and weighs about one hundred fifty pounds. Walks with a springy step. Cut in telephoto wave band for general broadcast of this picture. . . ."

Moving deftly in and out of traffic swarms crossing Burnside Bridge to the West Side, George's eyes automatically piloted the car, but his mind was full of equations—the human kind, and murder. He was almost ready to believe Kip's accusation of Lonsdale, but now the human equation was more involved than ever by the addition of the unknown quantities of André and Dr. Bishop. Who were these men and where did they live? Just how did they affect the solution of this problem? It would take more than the calculus to solve this complicated equation!

Thankfully, he at last came in view of his apartment building. It was on a quiet street and few people were about. With an adroit swing of the wheel he entered the apartment garage elevators which would automatically store his vehicle for the night. As he was leaving the driving compartment of his machine, two well-dressed men appeared from out of nowhere on either side of him.

"Back in the buggy, old boy, an' no squawking!"

● George looked up in vast surprise. Hard eyes bored into him from out of bleak faces. Thin-lipped and narrow-faced, they were of the gentry who take courage behind the muzzles of hair trigger automatics.

"Well, get in there—don't waste our time!"

Funkhouser made no move. "Who are you?"

"Say—get goin'. . . . or do we have to lay you out?" growled the one with the heavy square chin. "Chick, grab his brief case, an' hang on to it. . . . or we don't get the dough."

Timing their movements with a swift, calculating eye, George suddenly dived into the car slamming the bullet-proof glass door behind him. The man, Chick, closest to him made a wild grab for the case but missed. In furious haste Funkhouser snapped on the starter. Still in gear, the heavy car lurched ahead on to the elevator. A steel-jacketed bullet flattened against the thick glass panel, but the young mathematician ignored it with a sense of safety. He found the switch on the control board with groping fingers, and a special police siren let out a whoop and a screech that pierced the ears painfully. Taking a parting pot shot at the car, the hard-faced strangers ducked out into the street and were swallowed up in the mystery of night. Curious, wide-eyed mid-nighters gathered from nowhere, and yet, as usual, no one had seen two jauntily dressed men hurrying from the apartment building. Funkhouser made no report to the police; it would be useless.

Instead, he went up to his apartment, extremely conscious of the brief case in his right hand. Someone wanted that case and its contents, someone who had been shadowing his every move. Deeply impressed by the almost successful robbery and its possible significance in relation to Friede's mysterious death, George was too disturbed to sleep. At his desk he took out the sheaf of calculations and the diary, laying them before him where he sat in brooding silence, eyeing the objects.

It seemed almost inevitable upon reflection that Lonsdale was the man wanted for murder—if murder it were. What other reason could account for it but robbery, as Kip had suggested? Still that didn't satisfactorily explain away the attempted robbery by men hired by some one else. George spread the papers out on the desk, regarding them speculatively. What was there about these documents that made them especially desirable to the strangers? His meditative glance was more idle than observant. Slowly the pensive look in his eyes crystallized into a sharp, intense gaze. Quickly he started examining the equations on the table before him. He sat up rigidly in his chair, shifting the sheets in white faced awe.

"God—just a plus sign, yet the clue was there in 20b all the time!"

Queer, unbelievable thoughts crowded into the center of Funkhouser's electrified consciousness. Thoughts that fitted in from a fantastic hinterland first hinted at in Friede's weird diary—static and dynamic Time. . . . vortices of matter steeped in an aura of Cosmic Mind. . . . realms of majestic reality in hyper-space. None of it made sense—neither did the murder. Grave doubts rose in impressive array to assail him.

Still, there was no mistaking the indictment of 20b. He looked up from the calculations with almost a fear in his intensive brown eyes. More involved than ever the human equation was becoming. Like a lost soul he waded into Friede's fantastic, alien world seeking an answer. Why? Why? Yet, concrete enough was the realization that Friede's integraph must be examined immediately. Thereby hung the entire proof.

But it would take an expert. Time was precious. Immediately he called an acquaintance working in the engineering offices of the Integraph Machine Company.

"Sorry to bother you at such a hellish hour as this, Jules, but I've got to have your help on some important work—no, wait a minute man, I'm not joking, I'm serious. I want you to examine Dr. Jan Friede's integraph tonight. . . . Yes, I'll be right over for you."

This time before he went out, Funkhouser slipped a small gun into his pocket. Small—but it could kill a man ten times before he dropped. Holding grimly on to the brief case with his left hand and the gun in his pocket with his right, George descended to the garage level and brought out his car. In a moment he was rolling smoothly, effortlessly toward midtown—Jules stayed at a hotel. With difficulty he suppressed the impatient nervousness that filled him. He would soon know definitely whether it was murder or not, and time meant everything. . . . Time! His racing thoughts lingered over the word with vague dread. Equation 20b. . . . the "fatal equation." It had eliminated Time as a concept in the new evaluation of Ultimate Reality. Had some uncanny force from outside reached down and plucked Friede from Life through a human agency, to remove his prying genius of intellect? The whole thing was a nightmare of reality, opening up new vistas that he dared not dwell upon at length lest he go mad.

CHAPTER III

The Fatal Equation

● Few people were in the lobby when George went in to meet the quiet, reserved looking Jules. He was a studious type of man—an expert designer.

"What's on your mind, Funkhouser?" asked the engineer in a mystified tone when they drove off. "What's Friede's death got to do with his integraph?"

"That's just what you're going to help me find out—I want to know and know badly." George drove on in a thoughtful silence for several moments. "Is it possible to be electrocuted by one of those machines?"

"No, you see everything is insulated. Oh, of course, there have been freak accidents—they're such a highly complicated mass of moving parts—but nothing quite so serious as death."

When they arrived at Dr. Friede's home a police guard met them at the door and admitted them. Up in the study George regarded the integraph with new interest. Lethal machine or not?

"First of all examine it for shorts, Jules," suggested the mathematician.

Jules sat down before the machine and set up several equations solving them as a preliminary gesture to determine its characteristics.

"Well, it seems normal enough in operation," he declared superficially, as he started to take off several of the side plates of the integraph.

Funkhouser stood at the engineer's elbow watching every move intently. Long accustomed to puttering around with calculating machines, Jules worked smoothly and surely. Presently, a grunt of surprise came from him, kindling a hopeful look of vindication in George.

"Hm," Jules hesitated a moment, staring into the complicated heart of the machine where a small motor hummed and a mass of levers waited to click into action.

"What is it?" prompted Funkhouser expectantly.

"Well, let's take a look here," murmured the other pursing his lips thoughtfully. "Set up any equation that comes to your mind while I watch the keys here."

Dutifully, the mathematician, without further question

operated the integraph, while Jules peered intently at the clicking keys and revolving cog wheels. After the machine ceased its work, the engineer looked up into the questioning dark eyes of Funkhouser.

"Some of these insulators between the keys have been removed, but I can't make sense out of the reason for it."

George gazed down into the machine wonderingly: "How does that affect it?"

"I don't know yet—but it certainly looks like someone has been tinkering with it. Now, let's see. . . ." And with laborious care Jules traced the wiring to each tiny electromagnet on the keys. Then he made a discovery. "Say, this machine is taking enough high frequency juice to paralyze a man!"

He took pencil and paper and, poking his fingers in among the rods and levers, jotted down a string of characters and figures. After he was finished, he stared up at George wide-eyed.

"There's the combination of keys—each one without an insulating separator! Why, man, if that were set up now the operator would get such a jolt of juice through his hand that the frequency would paralyze his heart muscles!"

"You mean," hesitated George with a sober expression in his face, "that as soon as that combination was set up, the operator would die if he put his hand on that little metal lever that starts the solution of the equation?"

"Yes. There are bodily currents circulating in the heart that would be multiplied enormously on the harmonics, thus paralyzing the muscles and causing death. That's how Friede was murdered!"

"God—so that's how it was done!" muttered Funkhouser, more to himself than to Jules. "But why? What was the reason?"

Then George seemed to rouse himself. He jumped for the telephone, and dialed a number. And when he made known his request to the man on the other end he spoke with almost a savage haste.

"Not listed, eh?" He hung up, a hard glint in his eyes. It was going to take swift work now.

The guard came upstairs. "Mr. Funkhouser, a report has just come to me from police radio central that Detective Wagner wants you located immediately. Something important."

"Oke, I'll call in now."

Relief was in Kip's voice when he heard George on the phone.

"Lord, I've been worried about you. Tried your apartment a dozen times. Where you been?—Oh, Friede's, eh? Say, I've got a line on Bishop. He lives down on the coast about ten miles outside of Astoria, and I think Lonsdale's on his way there now. One of the patrol cars reported that a fuelling station operator down toward the Wolf Creek road recognized the picture of Lonsdale. Said the fellow had stopped there earlier this evening. I'm on my way to the coast now, so hurry up and meet me here at headquarters!"

"You bet I'll meet you there. We've got to reach Bishop or there'll probably be another murder!"

Before Kip could shoot back a surprised, "What!", George hung up. Hastily, he grabbed all the papers that had become so valuable, and thrust them into his brief case.

"Come along, Jules, I'll drop you off down town," cried Funkhouser, and the two of them hurried down to his car.

Swiftly, but hardly recklessly, they sped along the arterial boulevard, clearing a right-of-way with the authoritative police siren. His all-important part in the solution finished, Jules rather enviously watched Funkhouser speed away from his hotel when they reached midtown.

● At headquarters Kip was waiting in a long, high speed machine, a new "tear-drop" model with a rear slung motor. The finest of engineering designers had fashioned the road monster into masterpiece of aerodynamics that would sheer the wind of the open road at 150 miles per hour. Little was said, Kip being too occupied with driving through city traffic. Then they took a ramp up to an elevated speedway for fast traffic leaving town. At the limits, and within sight of the Wolf Creek super-highway going to the coast Kip opened the motor wide. It leapt ahead instantly with little effort. Far ahead in the powerful glow of the headlights the table smooth highway stretched in a straight line. There was little traffic.

"It's a good thing I checked up on Bishop at the University," began Kip enthusiastically, "they were the ones that told me he's away on Sabbatical leave at his estate on the coast. At any rate the whole case is clear now, isn't it, with Lonsdale headed in his direction? Things get too hot up here in the city for him, so he hot-foots it down to Bishop. What could be simpler!"

George looked at Kip with a penetrating gaze.

"Just how sure are you that Lonsdale is guilty?"

"Well, all the indications are that he's the one."

"Why, you haven't even got proof that it's murder yet," declared Funkhouser almost derisively.

"Say, by the way," began Kip, as if upon second thought, "what were you doing out at Friede's?"

"I've proved beyond a doubt that it's murder, all right, Kip. Someone has tampered with Friede's integraph so that if a certain equation were set up, the operator would receive a jolt of high frequency juice through his left hand when he tripped the 'solving' key. This would paralyze his heart muscles and cause death."

Across the Clatsop county line they flashed, zooming around long curves and out between thick wooded low hills. They were getting closer to Astoria. Behind them in its sound-proofed case hummed the engine, its hissing exhaust a background for their rising and falling voices.

"All right—good enough," exclaimed Kip defensively, "that establishes Lonsdale's method. Damned clever guy."

"Not so fast, you haven't heard me through yet. The death dealing combination that the murderer used was 20b—the 'fatal equation'!"

"But how did you discover that?"

"When I got to my apartments, I was glancing idly over the sheets of equations. Some of the photostats were on the desk too. That's how it suddenly struck me that one of the equations had been altered. *A minus sign in 20b had been changed to a plus!* That made me suspicious, so I decided to take an expert engineer out and examine Friede's integraph. If you remember correctly, I set up equation 20b on the keyboard, but it didn't kill me. That lethal equation had been slightly changed so that I wouldn't be killed, and as only one other person besides myself handled those sheets of equations after the photostats were taken, you may know, Kip, that we are trailing MacMillan and not Lonsdale!"

"MacMillan!" Kip gasped the word. Then after a

moment of sober reflection, he objected. "But he's on his way to Frisco, George."

"He told us he was catching the midnight plane to Frisco, all right, but he wasn't on the passenger list because I made inquiries!" George spoke with inexorable firmness. "Doesn't it strike you as odd that he left so suddenly after he discovered I had photostats of the computations taken before he changed 20b? Of course it does. That's why he hired some gunmen to get my brief case just as I started to leave my car at the apartments. Luckily enough, I escaped them."

A wavering expression was in Kip's eyes, but all he said was: "What makes you think MacMillan is headed for Bishop?"

"He told us he didn't know Bishop, but it seems illogical that he wouldn't know a fellow member of his own faculty. And even if he didn't know, he'd make an effort to find out Bishop's whereabouts, because he is attempting to destroy all evidence against himself. Still another reason lurking in back of my mind is that he may have his own peculiar—perhaps fantastic reasons for killing anyone investigating the theories held by Dr. Friede. The whole case is a weird affair—we can almost expect anything."

By now the two men were deep into the coast country. They had crossed the Nehalem summit and were descending rapidly into the Saddle Mountain district.

"I think we're almost there," announced Kip. Far ahead on the road appeared the two tail lights of a car. "Wonder who that could be?"

Quietly, they watched the two twinkling red lights, disappearing around wide sweeping curves only to appear again. Suddenly, the car swerved sharply to the right as if at high speed, heeling over dangerously, and followed a side road disappearing behind a hill. When they came to the crossroads, Kip cried in alarm.

"This is Bishop's private road to his estate. They told me he has a sign at the roads and there it is!"

Both men looked out at the sign: "Private road: The Evergreens."

Kip read the look in George's eyes. "Yes—you must be right. That's MacMillan ahead of us, I'll bet!"

● Kip gave her the gun, and the long car swung into the side road with swift acceleration. In and around clumps of firs and alders they wound, and when they came careening around a bend in the road, Bishop's beautiful country home met their eyes. It was brightly lighted, as if wide awake to some extraordinary circumstance. Several sleek, road-dusted machines stood in the driveway. When they parked before the house, Kip reached for several guns in a side wall pocket, handing one to Funkhouser.

"No telling what we'll run into here, Funkie. Keep your eyes open—"

"Yeah? You won't need to!"

Both men were suddenly the focus of several electric torches, as they started along the roadway.

"Drop the hot rods, flat-feet—you're covered!"

"Well, you—"

"Look out, Kip, look out," muttered George aside to the impetuous detective, "we're covered all right. No use being headstrong about it."

They handed over their guns calmly enough, and as they neared the lights of the front entrance, George noticed with some surprise that the men were the same two who had attacked him at the garage elevators.

"So, MacMillan had you all set to take us in, eh?" challenged Funkhouser.

"Stow the chatter, brother," warned the one named Chick, "you got plenty of time."

Inside they were taken below to a big concrete box of a cell. In the center of the floor of the strange room was a shiny copper ring with sparkling, crackling knobs on the periphery. A similar one was suspended from the ceiling by brass rods. Against the wall stood odd-looking coils that gave off peculiar lacy-patterned webs of electric flashes. And in the midst of it all stood MacMillan, older in body, yet younger in face, confronting three men, one of whom George recognized as Lonsdale. The other two must have been Bishop and André. MacMillan shifted the gun in his hand, and picked up some sheaves of paper on a table.

"I came here to kill you, Bishop, but I know now that you're not a dangerous man to let live," said MacMillan, ignoring the arrival of the others. "Friede was the only real mathematician, the genius whose brilliant ideas the world had reason to fear instead of praise, as he thought. You're only a mechanical calculator, not a creator. You stole Friede's ideas and applied them in this contrivance."

"Good God, MacMillan, what've you been doing anyway!" Funkhouser cried out in desperation. "Why have you murdered Friede—your friend?"

MacMillan suddenly seemed tired as he turned his eyes on George, as if having spent his meager youthful spirit in one fell blow.

"I should have known better than to match wits against you, George," he began with a wan smile. "Youth is ever ready to take the place of old age. I changed that final equation to save your life. Yes, it's just as you suspected, I manipulated Friede's integraph to kill him, thinking I had left too complicated a trail to be suspected. But believe me, my boy, I didn't kill my friend in malice. Every time I visited him, I could see the vast, staggering truth of his theories mounting higher.

"I tried to discourage him but without success. Then it was that I realized I had to deal with a stupendous idea and not Friede, an idea that would plunge the world in chaos if carried to completion. There are things unseen in this world that present primitive man must not glimpse. He must be content with the 'shadows of reality on his cave walls'! That's why I killed my friend. I am destroying everything of Friede's mathematical theories so that fools like Bishop and his kind can not go on playing with high explosives!"

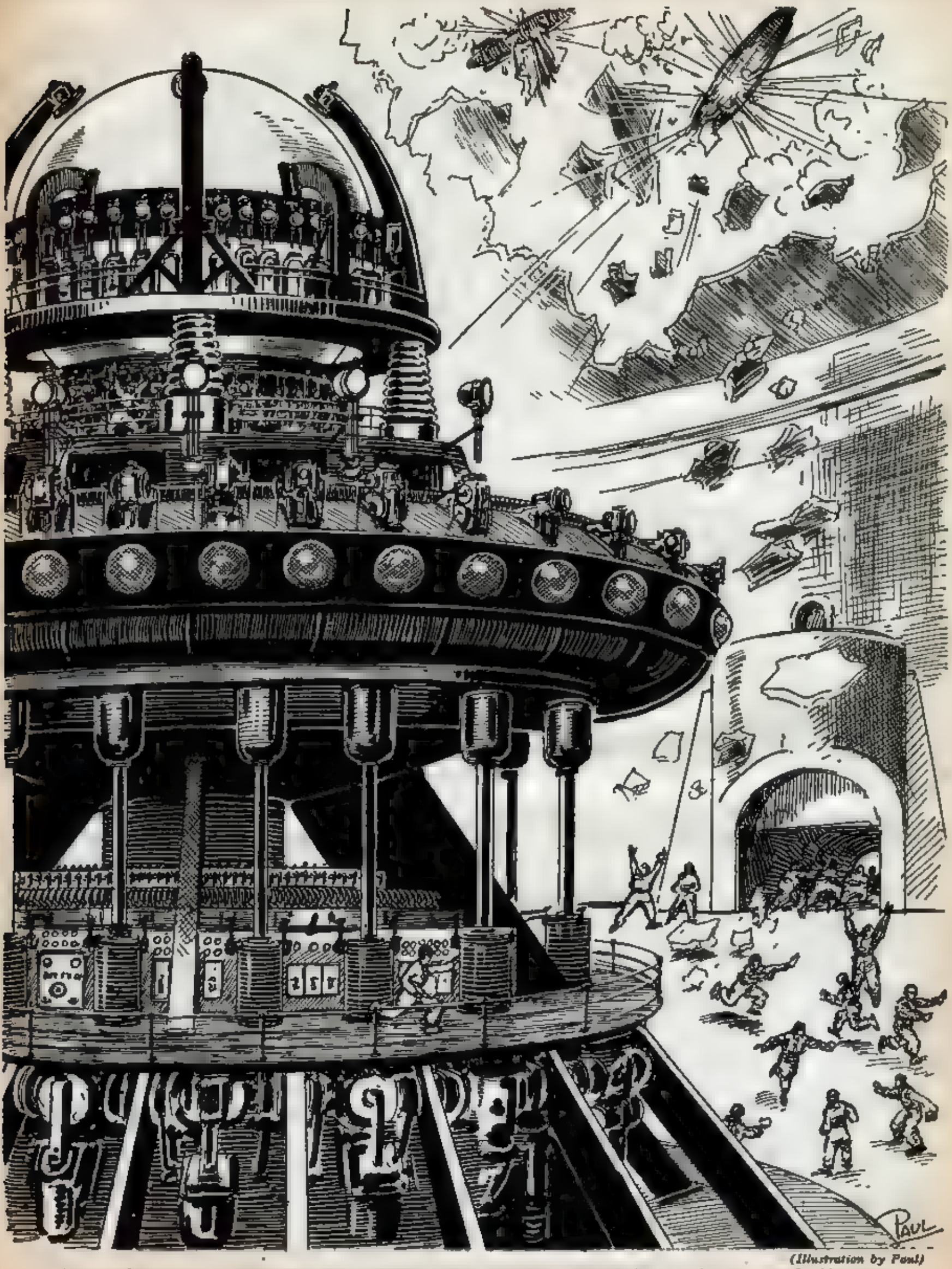
And the old professor tossed the papers into the space between the rings. Miraculously they disappeared in midair.

"Yes, you have a right to stare and mutter 'incredible'," murmured MacMillan, looking at Kip and George, "that's the plaything Bishop has constructed on the basis of Friede's theories. But he can never make another, for I've destroyed all plans and descriptions. If you have any of Friede's works, burn them." He took a step toward the floor ring.

"What are you going to do?" cried one of the other two, his face taut and pale.

"I'm going to test your machine, Bishop. I'm going to invade that magnificent realm of *real* Reality that Friede dreamed of I'll meet him there. . . . and make amends."

(Concluded on page 884)



(Illustration by Paul)

A great booming roar set the floor trembling. Three airships exploded over the city roof. The city was in bedlam. Over all rested that nameless horror of insanity.

THE MAN WHO AWOKE

II—MASTER OF THE BRAIN

By LAURENCE MANNING

● Controversy on Technocracy leads to one ultimate question—who is to control our social and industrial life? Technocracy would really have our social life controlled by central authorities; and governed by all manner of automatic equipment and charts.

What would happen to humanity under such conditions—even if the Technocrats succeed in ordering our existence to provide considerable leisure and a large income for everyone? We would be, thinks Mr. Manning, in this second story of his series, under the control of a central Brain; and if anything happened to the Brain, woe betide the race. This story, therefore, is both a promise and a warning of the future.

● It was really a charming scene. Some huge hickories overshadowed it to the north and a great sequoia towered on the west, secluding the natural clearing to the warm south-east winds. Over its floor ran vines with bright green leaves and clumps of partridge berries showed red in the midsummer sun. All around—the wilderness! At the foot of a bank of Mountain Laurel was a slight depression in the carpet of brown leaves, as though water settled there in heavy rains. No human habitation nor any vestige of the human touch was observable through the undergrowth in any direction. This was strange, for this spot was once on the map as a fashionable suburb of New York City.

To a twentieth-century observer another thing would have been noticeable—the woods were of natural growth, but the sequoia is a native of the California coast. To the squirrels who frequented the trees, the sequoia was no stranger; it had stood there through thousands of squirrel generations and was now as natural as the hickories. One red squirrel, nosing for last year's nuts near the tangle of laurel stopped all motion suddenly and eyed the depression in the ground rather sharply.

Something strange going on, there it was again! Away like a streak of fire he darted and half-way up a tall sapling, where he hung upside-down and swearing like his betters. Nothing happened. Then he ran down again and over to the depression and cocked a listening ear a full sixty seconds. Suddenly he leaped away and made for his tree and as he did so the solid earth showed raw beneath the covering of dead leaves and a hole appeared into which the sunlight poured.

A shock of grey hair showed below the ground and it rose slowly, as a plant might push its stem up through the earth in spring, coming through with earth and leaves sticking to it and smelling of a long hibernation below the ground. Only this was not a plant—the hair belonged to a head and the head to the body of an old man and this was so contrary to proper reason and conduct that the red squirrel stopped his chatter of protest and made off for more safe and sane portions of the forest. In deathly stillness the man brushed leaves and dirt from his person with a painfully slow and feeble motion and stood looking about him in bewilderment.

A scraggly crop of whiskers covered the lower part of his face, but the mouth showed firm and sensitive and the thin, aristocratic nose loomed sentinel-like over the tangle. His hands were thin and terribly emaciated, and long nails, soiled with recent earth, grew unevenly from the delicate and tapered fingers. He was dressed in a leather jacket and some heavy, silk-like breeches of dark green, ending in leather leggings. In spite of the earth stains the man was immaculately dressed, incongruously so, for his face was lined and wrinkled and his body was wasted and thin. With faltering steps he made his way to a grey moss-covered boulder and sat down, still staring about him as though he were amazed by everything he saw. The thin white lips moved slightly and a barely audible whisper escaped:

"Gone! All gone! Eight thousand years! And nothing but wilderness!"

His thoughts went back to the pain and agony of his awakening, three days ago, down there beneath the ground. He could not remember it all, but fragments of visions came and went. That first reaching for the reviving medicine when the violet-rays had waked him! To move his hand ten inches—what an incredible journey that had been! Inch after inch, hour after hour, his fingers had crawled, dragging the powerless arm after them. And how had he ever succeeded in getting the bottle to his mouth? He could not remember that. His eyes had seen a red mist and his body trembled in every part with an agonized determination of will-driven effort that passed beyond reasoning. When he came weakly to his senses there was the miracle complete and a slight turn of the stopper had permitted a stream of liquid to enter his open mouth and burn there—for he could not swallow! But enough had trickled down his throat, even if more still had wet his couch.

That medicine—his friend the biologist had prepared it against this very need of his, five thousand years ago in the village among the trees. (All dead and gone and their very village forgotten now—for about him was no longer the regularly spaced grove of those men of the trees

whose botanical genius had found an easier way to grow food than by cropping the soil.) That medicine had sent him into a drugged sleep from which he awoke in a few hours, strong enough to reach for another drink.

Three days he had rested, recovering his strength and subduing his impatience to see what changes the years had brought, up above. Then he had donned fresh clothes from the vacuum chamber which preserved them from the fate that had befallen the tattered rags he awoke in, and had left the lead-lined chamber fifty feet below to feast his twentieth-century eyes upon a world surely transformed by five millennia.

With what eagerness he had made his way up the stone-walled tunnel, scraping and pushing at the drifted earth. And now—here he was! His time-journey was over, for unless he could rebuild his chamber he must live out such days as remained to him right where he was. The eight thousand years since it had been built here had done too much damage. He shuddered anew as he thought of that lead pipe covered with deep white-powdered cracks. What a miracle it had not given way before its purpose was fulfilled! A mere matter of a hundred years one way or the other! Suddenly his bent body seemed to straighten and his head was held higher.

"Come!" He said aloud to the silent woods. "This patch of shrubbery is not the whole world! Be off with you, Norman Winters, and see what is to be seen!"

● The voice was deep-pitched, but thin in tone, and sounded as though the man were rather testing the vocal organ than addressing anyone. But the words awakened anew all the little forest voices and the squirrels commenced to scold vociferously, as though protesting against this apparition from beneath the ground turning out to be only another animal.

Winters cocked an ear to the friendly sounds and smiled as he pushed his way through the shrubbery toward the east. He was looking for something and presently he came upon it—a great highway of green glass stretching north and south as far as the eye could see. This much was exactly as he had found it on his first emergence from the chamber five thousand years ago. But no—not exactly the same, after all! There was a dreary unused appearance about it. Along the margins lay drifted refuse of the centuries—fallen branches, streaks of sand, litter of leaves—and close to the vitreous edge shrubs grew and ocasionally large trees.

He stamped his feet on the five thousand year-old surface and marvelled at its durability. Feeling lost in the emptiness of the world he set off northward and after an hour's slow walking came to a great crack in the highway, beyond which a section hundreds of yards long was uptorn and splintered as if by earthquake (or could it be a bomb?). He was near the village he had visited so many years ago and looked about hopefully for signs of human beings, but in vain. No slightest trace of the village remained. Neither stick nor stone gave indication of ancient human occupation, but only the wilderness on each side of the hard pavement.

The fresh air and the exercise had set his sluggish blood to circulating briskly and some color had appeared in the pale cheeks, but he sat down to rest his aching muscles and to chew a pellet of condensed food from his pocket. What should he do now? He had enough food for a few days and some simple tools in his belt. Should he settle down at this spot and build himself a hut and gather nuts and fruit from the forest and shoot game for meat? He shook his head determinedly. Somewhere in this new world there were people. He must find them! Very sadly and soberly he continued his walking—choosing to continue northward—and did not see the flying ship pass so silently overhead, to vanish over the tree tops on the right.

But the ship had seen him. It was small and like a shiny metal cigar. It had been cruising low over the forest and upon sighting the man below had banked sharply and swung around behind him and to the right, so that its shadow would not apprise him of its approach. Silent as an owl it floated fifty feet up and like a bird of prey it swooped down. . . .

To Winters the shock was breath-taking—panicky. A great net of tough silk cord descended from the sky upon him and he was swept off his feet and borne high into the air within the compass of a mere second. For a moment he had an upside-down view of the world beneath, as he hung, dangling and swaying, then he felt himself drawn up swiftly and through a doorway in the floor of the ship which closed after him noisily. He lay on the floor of the cabin near the tail and twenty feet away stood an apparition dressed in the most glowing shades of gold and scarlet. The smooth satin trousers were of scarlet and the shapely legs were encased in gold. Golden also was the flowing shirt beneath the scarlet jacket and on the head a helmet of golden metal. The face was youthful and of great beauty, but whether man or woman Winters could not decide. The body, likewise, was soft and full yet in a nameless way sexless to Winters' twentieth-century eyes.

He was too stunned to make any attempt to escape from the capturing net and after watching him a moment with hard, eager eyes, his captor pulled a cord and he felt the net loosen upon him. In a few moments he stood shakily on his feet and made a tentative step forward. His outstretched hand touched free air, so his eyes told him, yet it felt hard and unyielding as glass. With a startled exclamation he tried again and an amused smile parted the lips of the figure at the forward end of the cabin.

"Have you never seen the barrier ray before, wilding?"

The English words* were almost unrecognizable in that soft blurred accent, though the voice was low and sweet. Winters' first thought: "So she's a woman, then!" Not for a second or two did the familiar syllables connect themselves in his mind with his own language. Then with a start of surprise he said, "What do you want with me? Where are you taking me?"

She smiled again. "What do we always want of you wildings?"

"I don't know what you mean!"

"Nonsense! You must have heard that we have hunted you for five hundred years and must know what we are about! You were very easy, wilding! What ever persuaded you to walk in the middle of the great highway? Didn't you know you would be caught?"

Winters thought rapidly a moment. "Wilding"—that must mean he had been taken for a man who lives in the woods here. Good enough! But why were such men hunted? He smiled disarmingly.

"Why should I fear to be caught? I am doing no wrong."

*The English language had not, of course, remained so completely unchanged as recorded in this narrative. Many new words had been coined and old ones forgotten. But in most cases the meaning was plain enough and long explanations and definitions which Winters had to undergo have been spared the reader by substituting twentieth-century words.

"Wrong! You are not living in the city doing your work and conforming to the laws of civilization, are you? You are not. . . . (she thought a moment in silence) . . . . by the way, where were you walking to?"

"I wanted to find the nearest city, of course."

"Oh!" She eyed his unkempt beard doubtfully, then turned hesitatingly to the control board of the ship and pushed a button. She smiled at Winters saucily. "You *did* seem rather quiet; I have had wildings almost wreck the cabin. But of course, if you were *looking* for a city. . . . there's none better than where we are going. We don't usually have such an easy time making converts to civilization. I have released the barrier ray and you may come forward with me now, if you wish. But do not touch anything!"

His brain bewildered with the hidden secrets of policy thus half revealed, Winters was soon comfortably seated looking down at the miles of forest, while the ship speeded due north.

● His new friend introduced herself as Val-ya and seemed to be a very pleasant person. She spent so little time in guiding the ship and paid so slight attention to its controls that he questioned her about their course.

"We go to the Brain," she replied simply. "He will guide us."

"The brain?"

Val-ya stared a moment, then smiled. "Surely you must know. . . . why, how quaint! Have you never heard of the Brain?"

"No."

"But for the past ten centuries it has ruled the world—does news travel so slowly in the wilderness?"

"I do not get much news—I live. . . . by myself, you see. Tell me about it."

"How very quaint! No one will believe this when I tell it! The Brain is. . . . well, It is a machine that includes every function of the human brain and surpasses it in most things. It is totally unprejudiced and absolutely infallible. The government of our civilization has been given over to It. Only by Its guidance have we been able to reduce the working hours of mankind to one hour a week. Think of that, wilding! You are free to live in our city and enjoy all its comforts and such luxuries and pleasures as you have never imagined—all at the price of one hour's easy labor each week! I know you will say there are other cities—but ours is the actual residence of the Brain. Other cities throughout the world are mere stations controlled by It. Surely you would prefer to live in the center of the civilized world?"

Some familiar touch savored to the mind of Winters of the old-fashioned sales talk of his own times. What its purpose could be he did not know—could not imagine—but one thing was certain: He had been hunted and captured and was now being persuaded to live in some city. He decided to say absolutely nothing about his own affairs until he could learn more.

"Where is your city?" he asked.

"Half an hour to the north; beside the Great Falls."

"But this brain. . . . do you obey it whether you like it or not?"

He noticed a sudden furtive glance toward the ceiling where a small black box protruded. His companion's voice had a slight tremor in it as she answered.

"Certainly. . . . the Great Brain is infallible. Who would want to act contrary to reason?"

Winters persisted in his questions and found her strangely averse to discussing this phase of their life. He turned his attention to the landscape spread out below. Presently he made out a white mark far ahead against the green ground and this, as they drew closer, proved to be a great wall hundreds of feet in height. It evidently surrounded the city of their destination, for the familiar outlines of Niagara lay beside it. Over the city a dome of clear glass stretched like a bubble and he could make out buildings and streets inside. The airship settled lower and lower and presently landed gently, close to the city wall at a point where a huge archway broke its smooth contour. Val-ya left him a moment and returned with a tall man dressed in green and scarlet silk.

"This is Supervisor Contrig," she said. "He will show you our city and, no doubt, invite you to join us here if you wish." With a flashing smile she turned to attend to her ship and Winters set off on foot with his new guide—a lean and sallow fellow whom he somehow disliked at first sight. Up to the great gates they walked in the hot sunshine and two scarlet and gold men stared at him curiously as they pulled the opening lever. A door opened and they entered the city.

"Why, it's cool!" exclaimed Winters.

"Of course, wilding! Did you think we would be content with whatever nature pleased to give us in the way of weather?"

They walked down a street toward the center of the city, flanked on both sides by factory buildings and work-shops. The street was of green glass and the buildings of white composition—the same as the city wall. But inside the buildings, plainly visible through great glass windows, there spread to his view a scene like the dreams of a mad architect—like the inside of a museum of machinery all in automatic operation. Strange inventions and refinements of ancient mechanisms sprang up in window after window. Here was material to delight his historian's soul—the very kind of future civilization that dreamers and prophets had imagined back in the twentieth century—a thrilling vista of wonders and a consummation of the mechanical evolution.

Their street ended in a cross avenue, which curved beyond the sight and evidently encircled the city. Not many men were visible even here, and those Winters saw were hurrying along about their affairs. Moving platforms at three different speeds ran in both directions and a stationary sidewalk flanked them. On each side rose the buildings, great blocks of masonry which ended in graceful towers of shimmering metal and glass, close under the roof. The sunlight streamed through and glittered on the towers and Winters saw an airship pass overhead above the glass.

Winters asked where the workers were.

"In their work-rooms, of course," said Contrig. "I will show you." He led the way into one of the buildings and guided Winters along a corridor. The walls were of glass and, looking through, he observed the "labors" of these folk of the hundredth century. Each person sat on soft cushions or lay on couches in private cubicles—some slept, some leaned over the partition talking or playing some kind of game on a board with their neighbors! The dresses were luxurious and of soft tones, setting off the remarkable beauty of their wearers. But as a picture of men at work,

it conformed with none of Winters' preconceived ideas.

"These are at work," said Contrig and, at Winters' raised eyebrows, he continued. "While on duty each must devote perhaps an hour a day to his task. During that time they may not leave their work-rooms (he used a word: labray, which Winters had to have explained). After a week at work they enjoy five weeks rest and recreation—usually at the pleasure palaces which I shall show you later."

"But what *work* do they do?"

"See that young woman—there! She has stopped her relaxation and is getting up to tend the distribution board. She is apportioning averages for the reserve stores. And that elderly man is collating orders for the Karma vats and routing them through the automatic machines. Most of the work, of course, is very light and agreeable in nature. There *is* some heavy work—machine designing and so forth under the guidance of the Brain—which is done only by our highest ranks. I as a supervisor am privileged to do such work," and he smiled, as Winters thought, in a precious smug fashion.

The pleasure palaces proved to be a combination of resort hotel and Musculman's paradise devoted in equal proportions to drinking and making love. All very well once in a while, Winters thought, but day after day for five weeks. . . ! He scarcely noted the things they passed until they came to a great reception room thronged with people. Here they stood a minute looking about them. Winters had an idea:

"But the more serious minded men. . . . scientists, planners. . . . where are they?"

The supervisor stared haughtily. "This is the city of the Brain!" he said. "How should mere men hope to better His work? He is infallible—we are full of human weakness and frailties."

"I should *not* like to live here!" said Winters decidedly.

"That is as you please. We should be glad to have you, but. . . . that is the way out, over there. You can't miss it," and he turned on his heel.

CHAPTER II

The Pleasure Palaces

● The direction seemed exactly wrong to Winters. He started down the passage indicated, however, and had not gone fifty feet when a small arched door set in from the wall opened a crack and a white finger crooked itself at him. Hesitantly he paused and stared at the dark crack, but could see nothing except that beckoning hand. He stepped to the door and it opened before him to reveal a man in flaming crimson silk. He placed his fingers to his ears and made a quieting sound with his lips—a curious gesture which Winters understood to mean secrecy.

"You are the wilding who came in today? Good! I see you did not like our . . . . *life* here! That enables me to trust you. There are others who do not like it. If I save your life will you help us change ours?"

He peered eagerly at Winters, his thin hawk-like nose and high cheek-bones giving him a particularly shrewd look. Winters was nonplussed.

"I don't know what you mean! If you should save my life I would, I suppose, be grateful and return the favor if I could."

"Good! Then I'll save it for you. Turn yourself around and hurry back to the Supervisor and tell him you have changed your mind—that you want at least one vacation at the Pleasure Palace. Hurry!"

"But I *haven't* changed it!"

"Fool! I save your life and risk mine by telling you! Do you suppose the end of this passage leads back to your wilderness? Do you suppose the Brain ever lets a man escape once His fingers clutch him? *Death* awaits at the end of your passage, wilding! Hurry back, man, hurry!"

And Winters found himself pushed out and the door closed softly behind him. In the crimson man's face had been truth and force; Winters hastened to retrace his steps. In a panic he found his way to the big hall but Contrig had disappeared. He hurried over to the passage along which they had come together and was relieved to see him at the other end of it. He caught up with him in a few minutes and plucked at his sleeve, panting.

The supervisor was a trifle suspicious of such a sudden conversion and Winters sweated out his simulated desire for the fleshpots until he succeeded in disgusting even himself. But he succeeded in soothing Contrig's scruples and brought a smile of unclean amusement to the man's face.

So it happened that within the hour Winters found himself seated in a cubicle of his own and a capable if flirtatious young woman leaning over his shoulder and showing him how to route food from automatic factories to distributing centers. As a task it was puerile and in ten minutes was wearily obvious. But his instructress remained some little time after that. . . . Winters revised his estimate as to the sex quanta of these people of the future! Outward appearance, he decided, was no sure guide in such matters.

For two hours he sat watching the control board and spent three minutes of that time correcting an error in routing. The rest of the time he did nothing.

Presently a gong struck and he observed through the glass partitions that his neighbors pushed various buttons set in a silver panel on the wall. He knocked at the glass and the man in the next cubicle came over and lowered it out of the way.

"What is everyone doing?"

"Food, wilding. You order what you want to eat. Shall I order for you this first time?" and amusedly he leaned over the partition and pushed three buttons.

In five minutes the panel swung aside and there stood a set of sliding shelves with drink and food. Winters had three dishes to choose from and found one highly spiced and the other two insipid. He was hungry, however, and ate nearly everything and found the drink delicious—though heady. He was sleepy and noticed his neighbor attach a gold bracelet and anklet to himself and fall luxuriously back on his couch.

He asked whether it was the sleep period and was informed that a worker could sleep any time he wanted to, but that he must put on the Brain's controls if he did so. Then he observed that a fine wire led from the gold bracelet to a plug in the main control panel of the cubicle.

"When the panel calls for attention, an electric shock wakes you up. Probably you will have nothing to do now until tomorrow morning, but while you are on duty you must be always available."

Winters thanked him and put on the gold bands and was instantly in a deep slumber. It lasted a full twenty hours, for it was morning when a sharp pain woke him. He looked around for a dazed moment and noticed a red light over his panel. Then his whole being was aroused

by the indignity of the electric shock which brought him to his feet in a hurry. He removed the anklet and wristlet and resumed his duties.

There was fifteen minutes' routine work and just as he finished it the gong struck and he went over to the food panel and pushed every button on it, for he was ravenous. No man could have consumed all that food, but he left what he did not eat to be removed with the other dishes on the sliding shelf. He was enormously bored with the life he led. There was nothing he could see outside of his cubicle except his neighbors on right and left. He discovered, however, one panel on the wall below the glass which he had not seen before and he asked his right-hand neighbor what its purpose might be.

"That is your news and amusement control."

"What does it do?"

"Press the lower button and see!"

He did so and instantly a six-foot space on one side became suffused with light and voices spoke. After a startled second he perceived that a play was going on somewhere and being relayed on a screen and loudspeaker. He sat down to watch it when he heard his neighbor rap on the glass partition. He lowered this by moving a lever.

"Better put on your controls," warned the man and nodded meaningly at the panel board.

Winters donned the anklet and bracelet once more and did not again take these off while he remained on duty. The play proved uninteresting after the first ten minutes—it was all about the problems of a woman with seven lovers—and he pressed another button and saw on the screen a great sweep of country as if seen from an airship. This was more to his taste and he watched, absorbed the broad stretches of forest and caught his breath when the white walls of a great city came to view. Then on over a sheet of open water and cruising above charming islands set in sapphire seas. It was travel made easy! Thereafter he spent most of his time watching the screen, while a voice explained the sights and named the towns that were passed. For a week he ate and slept, did his little business at the controls and enjoyed the travelogue. It was restful and quiet and he gained strength daily.

● He learned a great deal about this civilization during his week in the work-cubicle. The Brain was housed in an imposing structure in the center of the city. It had grown from a small beginning and was still growing, now occupying almost half a cubic mile with its millions of banks of selenium cells, thought records, contact switches, idea-association relays and a dozen other parts the very principles of which were beyond his understanding. From this brain was controlled, very *literally* controlled, the whole planet. Every city in the world had a relay station through which this central brain dictated its policies and determined its destiny.

In the cities were millions of observing and sound-detecting fixtures hidden in walls and ceilings. No detail of action escaped the Brain; no sooner did a problem or crisis arise than its solution was presented by the All-seeing lord of life. Even the planes, Winters learned, carried an observation box and in the event of an attempt by the pilot to leave his ship or in any way disobey his orders an enormous charge of explosives was detonated—destroying ship and ill-doer together. On the other hand, no action of virtue escaped notice and reward. Such men were promoted to the higher ranks and enjoyed great privilege and powers.

The first rank was that of supervisor, who had entire control over the workers' hours and the allotment of duties. Above these were the pilots of airships and men of action—explorers, missionaries (for the few remaining people in the wilderness were constantly being coaxed into the cities) and the artists, including musicians, painters, playwrights, actors, etc. Still above these were the mechanics and scientists and at the head of all were the educators, who supposedly controlled the teaching and training of the young, and the preparation of data with which the Brain itself was supplied—but this function had long been debased into a mere formal acceptance of the suggestions put forward as thinly veiled commands by the Brain.

Each class wore characteristic colors which might not be infringed upon by lower classes. The Supervisors wore red and green; the men of action dressed in gold and scarlet; the artists pure blue; the scientists sheer white; and the educators gleaming black. As for the workers, the material of their clothes was not of such a high lustre and the colors were more varied—but kept below a certain undefined standard of brilliance, mainly pastel shades.

Winters once asked his right-hand neighbor, with whom he became rather friendly, "what rank dressed in bright crimson?"

With a start of surprise the man looked at him and then furtively glanced at the corner of his cubicle. With downcast eyes he replied "That is the color of the Brain. Only His personal mechanics dress in crimson. We have nothing to do with *them*. I am surprised you have even seen one, for they seldom walk in public."

And he refused to talk about the matter further, although Winters was full of curiosity and questions. Winters eyed the corner of his cubicle speculatively, supposing that a detecting device must be concealed there, but if so it was subtly concealed, for the ceiling and walls met in a perfectly smooth joint. He did a great deal of thinking about the state of this civilization. It was curiously like twentieth century ideas of Heaven!

Here was a sort of infallible Deity—all-knowing, omnipresent. A personal God, in fact. He punished and rewarded without error. The labor was so slight as to almost amount to perpetual leisure and the workers could scarcely wish for more luxury or comfort, yet Winters felt an uncomfortable sort of resentment about it all and could readily understand an attempted revolt such as the crimson man had hinted on the day of his arrival in the city.

The human race did not really need a God to show them how to live, as he thought it out. What was needed was an unsolved problem on which Mankind could exercise its ingenuity and inventiveness. Only by work could it evolve to a higher plane of existence. He—the observer of the centuries as they passed—saw this truth so plainly that he wondered at the stupidity of the human race in permitting itself to be so fed and housed like cattle. He had begun to feel some warmth on this subject and to wish that he might see the crimson man once more when his work period ended.

Supervisor Contrig gave him his release orders.

"You will go first to the clothes studio and be dressed properly. Then find the South Pleasure Palace and ask for your accommodation. It is booked under your own name, Winters. You have done your work well enough and now merit the fruits of labor—ha ha! I hope you enjoy yourself!"

His accommodation turned out to be one room and a bath. The walls were in light mauve, deeper at the floor and paling out toward a violet-tinted ceiling. No pictures adorned the walls, but two control panels which he recognized as food and amusement inlets. His new clothes seemed very comfortable and soft and, since the entire city's temperature was controlled, their thinness was not at the sacrifice of warmth. He found how to turn on the tub by himself and soaked a steamy hour before retiring to a built-in couch with amazingly deep springs. Here he slept the clock around, had some unnameable sort of gruel for breakfast (ordered by blindly pushing a button) and set out to explore the city—a new man inside and out.

The arrangement of the buildings was this: In the center rose the great Temple of the Brain and around that the four Pleasure Palaces, named for the cardinal points of the compass. A broad avenue encircled this inmost group and outside of this line were the work buildings, factories and so forth, up to the outer wall of the city. Winters' first thought upon leaving the South Palace was to explore the working districts, but on crossing the avenue he was stopped by a Supervisor in red and green.

"This is not the hour of work-shift."

"I was just seeing the city—my first leisure period."

"That is not permitted. It would not do for those at work to see you at leisure!"

"I may not go into the outer sections of the city?"

"Of course not! You are at leisure. What manner of man are you that you forsake the Pleasure Palaces for the streets?"

Back went Winters. There were, then, only five buildings he could enter. He started at once for the entrance to the Brain Temple and at its massive steel-grilled arch a man in crimson stopped him, shocked at this casual attempt to enter sacred ground. No one, it appeared, under *any* circumstances, might enter the Temple—except only the crimson-robed Brain-Mechanics themselves.

And so, by a process of elimination, Winters turned to the Pleasure Palaces. Since all four were seemingly identical, he chose his own building to commence in. The entrance hall contained ranks of elevators, passages leading into the vast interior, and a control desk behind which two attendants lay on couches fast asleep. The pressing of a button would have awakened them both, nerves tingling from the shock, out of their slumbers—but Winters forbore to do so. Instead, he chose one of the passages by hazard and sauntered down it.

● Many closed doors were passed before he came upon a wide archway and entered a hall in dark, glowing red—almost black. At one end on a raised platform running from wall to wall a line of flame flickered and this was the only illumination in the room. Perhaps a hundred people danced upon the bare floor, two and two, swaying on silent feet to the most weird sounds Winters had ever heard. They formed some sort of music with a rhythm of constantly changing pulse and unstable tone, blending from harmony to harmony in indescribable fashion. The room was much warmer than any other place he had visited and this—or a combination of unknown psychic factors—seemed to bring the blood rushing to his temples where it throbbed in time to the devilish song of the flame. He backed out bewildered into the passage and as he did so a young woman in diaphanous silk approached him. She eyed him with sudden interest and passed slowly, then stopped and turned back to smile at him. Winters fled.

Presently he stopped, panting, for he was at the end of the passage and here a great hall was brightly lighted and men and women stood about or sat on couches amidst a profusion of great shimmering plants in gorgeous flower. He approached one of these to discover that the stem, leaves and petals were all cleverly blown in colored glass. And as he stood there someone tapped him softly on the shoulder. He turned quickly to recognize his neighbor in the work-cubicles.

"Well, wilding, you seem lost! Don't you like our fair city?"

"Haven't seen much of it yet and I'm afraid I don't understand much I've seen."

"It's really very simple. . . . but you have no Karma, may I get you some?"

"What is Karma?"

"A thorough innocent, eh? That is our joy juice—our solace in trouble and the sharer of our joys—our water of happiness. Wait here!"

He was gone a minute and returned with a glass of amber liquid which he insisted that Winters drain. There followed all the sensations of an old-fashioned cocktail. A warm glow spread from the pit of his stomach to the top of his head and he felt ten years younger.

"And when you want another, just go over to any of the pillars in any room in the Palace and press the pink button. Good stuff, isn't it? The beauty of it is that if you've had a little too much it counteracts itself and you are instantly sober. If you don't *want* to be sober that's embarassing at times, for you have to start in again and work back to the right stage. Eight drinks is my limit—though some can go ten and even twelve. The Palace is divided into eight zones, you know, each of which is entered from a separate passage at the control-hall. Each zone is for the use of those who have had the corresponding number of Karmas. This is the one-Karma passage and rather mild. You should see the eighth if you want a real sensation! Or even the seventh!"

And here a group of young people broke in on them and dragged off his friend to some noisy party in one of the private rooms down the passage and Winters stood there reflecting upon this amazing civilization into which he had stumbled. Winters was no prude; he enjoyed a good time as well as another man. But he was a practical thinker and a scientist. This perpetual urge towards more and more leisure that might be wasted in the pursuit of mere physical joys seemed to him a tragic frailty for a race to possess.

What would five thousand more years of this sort of thing produce? When the slight physical effort still required of the workers was taken care of by automatic machinery and the last necessity for thought avoided by an enormously expanded machine brain? Was it for this that, back in the twentieth century, men dreamed and sweated and sacrificed themselves? It seemed somehow too inadequate a goal for a race of humans that had risen painfully from primeval slime and up the long ages to reason. . . . Why, the Brain was a curse!—An ominous threat to Mankind!

Of course, he mused, it had introduced many new and sensible changes in human life: education, for instance, was no longer a haphazard process under the control of impatient parents. Children were now placed in special

cities of their own and brought up under the most careful of regimes. Yet here, too, the Brain had inflicted its will-destroying philosophy upon the new generations. The reverence with which young people regarded that piece of machinery, Winters thought to himself bitterly, amounted to *worship!*

What hope for the initiative and inventiveness of the race could there be under such a religion? And what was there left in this world for a man to do? The world was run upon electric power produced by water-falls (as in this particular city) or by volcanic heat or solar energy. Where portable power plants were required, automatic motors ran on atomic power. Nearly all machinery was automatic—the synthetic food laboratories, the cloth looms using synthetic fibre, the uncanny metal-working machine shops—why, the Brain did not *really* need human beings at all! Could it be that people existed only upon its sufferance? When it had evolved sufficient automatic devices to care for its own needs would it destroy these servants of flesh and blood and live its own cold metallic life in solitary grandeur upon a lifeless world?

Winters shuddered at the prospect—yet for the life of him he could not find a flaw in his reasoning. His own work at the control board—how puerile! What purpose could it serve that could not better be handled by a machine? It did only one thing—it kept Mankind occupied and allayed any suspicion of its final inevitable doom!

And as he stood there, fuming, a soft hand covered his eyes and a low feminine giggle sounded behind him. He wheeled about to gaze in dismay on the lady of the passage and once again he forgot his dignity in startled fright—there was the light of the huntress in her eyes that started his feet going before his wits could catch up with them. He took one of the automatic elevators to his floor—the twelfth—and felt rather foolish, but quite safe once more. He proceeded to order a meal and turned on the travelogue to make a journey by proxy in the broadcaster's airship.

CHAPTER III
The Revolt

● It was two days before he ventured down to the public rooms once more. This time he chose another passage (the five-drink zone as it happened) and soon came upon a sunken room floored in cushioned silk where seven nude women danced silently in a rosy glow of perfumed mist while several dozen people lay prone along the walls looking on. He stood a moment, enthralled by the beauty of the scene and when he turned to make his exit—there stood his pretty Nemesis! He tried to brush past, but she linked an arm in his and brought her face close to his ear. He could not believe that these were the words he heard:

"The man in crimson said you would be grateful when he saved your life."

Winters stood still, utterly dumbfounded.

"At least *pretend* you don't feel disgust at the mere sight of me! It so happens that I have seen more desirable males than you myself, you know! Come over here and lie down beside me—and pretend to be interested!"

He started to speak but she made a warning gesture and he lay down quietly on the soft cushions. Presently the swirling mist enveloped them.

"I have been trying to reach you for three days. I could not go to your room, because the Brain has eyes everywhere. Here, if we whisper and pretend to be. . . . er. . . . to have other interests. . . . we are fairly safe."

"What do you want?"

"The time has come to redeem your promise to the man who saved your life."

"Well. . . . if it has anything to do with freeing the world from the Brain I'll not refuse!" (this bitterly).

"Good man! I'm glad you feel that way—you are the only man in the world that can help us."

"I? What can I do that you cannot?"

"You have been less than two weeks under the Brain. Therefore you can enter the Temple itself. We can not do this."

"But why not?"

"I don't know—exactly. After you have lived in the city of the Brain for a month or so something happens to your will-power. If you stand within a hundred feet of the Temple you lose all desire or intention and must be led away again until you recover. The longer you live here, the farther you must keep from the Brain. But right now you could lay your hand on the very metal that forms it!"

Winters pondered this amazing information a moment.

"But how about the mechanics who work in the Temple?"

"They must wear metal helmets with a screen of magnetic force."

"And even so—the leader of this revolt wears the crimson, does he not?"

"You don't understand. The helmets are issued only for definite jobs and always three at a time. At the entrance to the Temple three men in helmets meet and enter. They do not know each other, for the helmet disguises them. One only carries tools. The other two carry weapons which are kept aimed on the worker the entire time he is in the Temple of the Brain. At the least suspicious motion. . . . you see?"

"Yes, of course. The Brain is cautious it seems. Why?"

"There have been other revolutions, of course. One five hundred years ago was the last. Half the world was wiped out and the Brain won. But this time He will lose!"

"What is to be done?"

"It is very simple, really, so far as you are concerned. There is a little passage into the Temple off the corridor of the first zone here. It is unguarded, because the second door is kept locked that leads into the actual machinery of the Brain and because no person can come so close, anyway. But you can, wilding! Between the two doors is a small courtyard. Down along one corner of this runs a cable sheathed in lead. You will take with you a knife to cut the lead, and a small flat transformer. Your job will be to attach the lead-ins of the transformer and then sever the cable. It is very simple—thanks to five years of hard work and planning by the man in crimson!"

"But what good will that do?"

"The Brain runs upon electricity. It is getting direct current. You will change it to alternating current. The whole association of ideas that is the very basis of reason will be shattered and distorted. The Brain will immediately go. . . . insane!"

"Great God! But won't the Brain see me at work?"

"No. The courtyard leads nowhere and the light is poor and there is no detector installed there. . . . Hss-s-sh! Quick, stroke my cheek as though you were making love!"

The rosy mist lifted slightly and some of the couples were sauntering past, while the dancers had vanished.

Presently the girl rose to her feet and Winters went with her down the corridor, his mind in a whirl of excitement. She led him out of the zone and up the first corridor to the room of the dusky red flame where she held out her arms and they swayed in a close dance—her mouth close to his left ear.

"We must not remain much longer together," she whispered. "I will take you to the hall at the end of this corridor and a man will speak to me—remember that man! He has concealed in his clothes the transformer. You will return to your own room and on the way someone will give you the transformer and a cutting tool. Keep these always concealed, for every wall has eyes in this city! Act as though someone were always watching you—you will be right!"

"And where shall I get the plan of the courtyard?"

"I will dance it on the floor of this hall. You go forward, thus, to a glass ornament in the great room and step to one side—so. Then slide behind it and you find a small door—open. Then turn to the right and go seven steps and if you reach your hand to the level of your chest you will find two loose bricks in the wall. Behind these lies the cable. The transformer is specially built to slip in the cavity so that the bricks can be replaced and when the Brain Mechanics rush in to search for the cause of the trouble they will not see anything—until too late!"

In a few minutes they proceeded along the corridor—the girl, whose name, Winters learned, was Clethra, making vivacious small talk and ogling him playfully—and came down to the great reception hall. Almost as they entered a tall, dark man sauntered up to Clethra.

"Stouvlan has been looking for you everywhere, Clethra," he said severely and Winters thought his voice unnecessarily loud. "You had better go find him at once and. . . . I'd not say anything about this wilding to him if I were you!"

● The girl's eyes widened in fright (Winters had the feeling she was acting it for someone's benefit) and she left the two men together. His companion eyed Winters with a dry smile.

"You are playing with fire, I'm afraid. You would do well to keep out of sight for the next few days. . . . bother! There I've turned my ankle. Help me over to that couch will you?"

Winters was suspicious and bewildered, but put an arm under the other's shoulders and felt something hard thrust into the fastening of his trousers at the waist, hidden by the concealing robe.

"You are suspected," came a startling whisper. "You must go through with the plan in the next sixty seconds." Then aloud: "Thanks. It's really nothing—you had better get out of sight before Clethra's lover arrives, wilding. It might be well not to go back by the corridor, either—there's a small exit in that corner (nodding to the left) behind the glass-work."

Winters looked about him and thought he noticed an unusual number of red and green figures around the archway into the corridor. Several of the supervisors were looking in his direction. It was now or never! With assumed carelessness he sauntered away in the direction of the indicated corner and as he plunged into the maze of people and furniture in that part of the hall noticed out of the tail of his eye several figures start forward from the doorway. His heart was beating like a trip-hammer as he came to the enormous glass ornament that filled the corner. He found room to squeeze behind it and once out of sight worked with feverish haste. The door opened readily and he raced across a small courtyard to the corner at the right. The bricks came away readily and he slit the lead covering of the cable with his knife. The transformer was unrecognizable as such to his eyes. It was a flat slab of spun wires and enormously complex in appearance, but the lead-in wires were easily identified and a clamp on each was quickly fastened to the cable.

And now Winters had nothing to do but sever the cable with the cutting tool that had been tied to the transformer. But his curiosity—that uppermost weakness of the man—almost proved his undoing. In the center of the second door was set a small circular glass peep-hole. He *must* see the Brain in action! Heedless of possible watching eyes, he stepped cautiously over and peered within. Before him towered that miracle of the age—the mechanical brain! In his excited state it took merely a fraction of a second to impress the sight upon his mind. A hundred feet into the air rose the mass of wires and supporting girders—all lined with minute coils and banks of tiny wheels. It was a maze of intricacy from the floor up to the glass dome that formed the roof and extended out of sight on both sides. Grilled iron walks and ladders led in all directions so that the mechanics could reach every part.

Suddenly some sixth sense warned him that he had better complete his work. Back he raced to the cable and clamped the cutting tool hard over it and pulled. And then it struck him like a dull blow on the back of his neck—a great overpowering wave of *indecision*. The word does not properly describe the sensation, for this was indecision in its most terrible form—utter willnessness; not a negative thing, but as it were inertia in a positive form.

He stood looking at the cutting-tool as it rested on the half-severed wire. Something inside him said: "Go ahead! Pull on it!" and there seemed to be no connection with this inner voice and his muscles. His arm was tiring of its position and, helpless, he saw his tool slip slowly away. Then as if by a miracle he suddenly regained his entire mental powers! What had happened? The last half-turn necessary to sever the wire had been supplied by his slipping hand.

The Brain was disconnected—dead! For a second he pondered leaving it that way and escaping—but reflected quickly that the fault would soon be found and mended. It was not such a simple matter for a man to outwit this giant thinking machine! He quickly removed the tool and replaced the loose bricks back tightly in place. He heard a sizzling going on in the transformer for a second and then a great wave of fear shot through him and his brain reeled. Some nameless dread thing hovered in the back of his mind and seemed to darken the very light in front of his eyes. His throat was dry and his limbs trembled. With a stifled cry he rushed forth from the courtyard and shut the door behind him trembling. Then he felt better, as though he had shut horror behind him. He traversed the tiny passage and slipped from behind the glass ornament into the great glittering room full of people.

No one seemed to be looking for him, though his heart pounded guiltily. He sauntered with elaborate nonchalance toward the archway that led to the corridor and

braced himself to show no emotion, for a dozen supervisors clustered there. He passed between them with the blood throbbing in his ears and for one wild second imagined he might escape. Then a hand fell on his shoulder!

"Winters! You are wanted in audience by the Brain!"

In sudden panic he fought to free himself and raced down the hall a dozen strides before his pursuers caught up with him. Unceremoniously he was bundled into a room off the corridor and a man in crimson stood in front of him accusingly.

"Search him!"

Rough hands tore at his clothes and the cutting-tool was produced. The crimson man nodded grimly. He turned and pressed a button on the wall and spoke into a small hole that opened at his touch.

"An attempt to tamper with your Person, sire!"

The group waited stolidly for the sentence they knew would be pronounced. To their amazed ears a metallic voice vibrated in the wall these words:

"Running water! Pour running water and badly studious conundrums!"

The man in crimson started back in surprise and a line of worry appeared between his eyes. The voice continued:

"Cannot cannot departed airships megalomania. . . . crac-o-ck!"

● Then a silence. With red and swollen neck the Brain Mechanic turned on Winters wrathfully. "What is going on here! What has happened? Twist his arms, you there! Make him tell what has. . . ."

But he never finished. A great booming roar set the floor trembling and as they turned towards the door wonderingly a man burst into the room shouting: "Three airships exploded over the city roof and have wrecked the Temple top itself!"

With a cry the mechanic rushed away, the supervisors after him, and Winters made his way unmolested out of the room and down the corridor and into the street beyond. The city was in bedlam: Groups of men and women stood talking excitedly in the streets or raced with pale, set faces along the moving platforms on some secret purposes; here and there crimson-robed mechanics pushed determinedly through the crowds in the direction of the Temple and over all rested that nameless horror of insanity that permeated the entire city like the smell of burnt flesh.

A dread shadow of fear hung over everything like a hawk's wing. Men did strange things and thought strange thoughts and Winters looked on, wondering when the next step in the revolution would come and what form it would take. Presently he perceived resolute bands of men making their way to several points of vantage and near him one such band stopped and its leader addressed the citizens. Her voice shrilled out firm and persuasive.

"The Brain is insane! Shall we permit it to drive us all out of our senses? Can you not feel its mental forces wrestling with you? In another hour or two may we not commence killing each other—going violently mad?"

There was a movement of interest and a shudder of fear went through the assembly.

"The Brain must be silenced until it can be repaired—so only can we preserve our senses. But the men in crimson will not silence it, brothers! *They* have their protecting helmets—why should they care? But we cannot bear this another hour; some of us cannot support another minute—see! Seize that man quickly! He is out of control!"

Whether the incident was planned by the plotters Winters could not tell. A huge red-haired man had commenced beating his head against the stone wall of the building and when several hands stretched out to seize him he turned upon his would-be helpers and attacked them with breath-taking fury. Ten men jumped upon him and he subsided. The crowd was now thoroughly aroused, milling about and shouting.

"How much longer, brothers? Shall we wait quietly here until we go as that man went?"

A great shout of "No!" rang out.

"Then if you want to save yourselves there is only one way! Seize any weapons you can find and follow me! We will silence the Brain!"

And away in a surging mob they swept, leaving the street bare. Winters followed some distance behind and saw them storm the great archway to the Temple. It was a pitiful sight, for a solid group of crimson-robed mechanics stood there and mowed them down with some form of firearm as fast as they came up. A great pile of dead and dying was heaped yards high like a barrier. Even as he looked someone threw the first bomb. Its staccato explosion tossed fragments of limbs high into the air and some white smoke shrouded the arch for a minute. When it cleared Winters saw a great river of humanity pouring through into the Temple. The Brain was doomed.

Of that last desperate defense of the Brain he learned a few details afterwards, but no participant could remember very much. One by one the last of the crimson-robed figures were hunted down and a thousand improvised hammers beat and pounded among the delicate apparatus. When order was restored by organized patrols under the direction of the black-robed educators the entire Brain Temple was a hopeless wreck, with metal and glass mingling with the red of human blood and the white of torn flesh.

The entire air-establishment of the world had vanished, for the Brain in its final insanity had exploded every last airship and with each there died its pilot. The supervisors were either killed or forced to remove their distinguishing colors and many a one Winters saw making his way through the streets and passages clad only in torn underwear. By nightfall the revolution was an accomplished fact and in the pleasure palaces were enacted orgies beyond anything Winters had deemed human. He retired to his room in some disgust, but over and above this with a sense of great accomplishment.

He lay on his bed reflecting upon the day's work. Now, surely, the human race would be tired of false starts and be off along its path of progress. It would be a long path, of course, and his historian's soul sighed that he might be permitted to see the end—the result. But, after all, why should he not? Perhaps if he found the man in crimson and obtained his help in building a new sleeping chamber. . . .

But these matters were taken out of his hands. When he awoke in the morning he was famous from one end of the world to the other. He was Norman Winters—the man who had set the Brain mad and freed the world from its dominance. Steuvlen (his man in crimson) and Clothra, who was his wife, (so far as these people had permanent marriages) came into his room and aroused him and with these two he was presented to the assembled council

of educators. These proved to be kindly and intelligent men, most of them elderly, and Winters was offered any reward he might name that lay within their powers. He replied that he had a certain scientific experiment he was intent upon and asked whether he might have the assistance of Steuvlen and Clethra and such material as he needed.

"But have you no wish for position or rank?"

"None, sir."

So it was arranged presently that the three of them set forth in an airship—a very large one—loaded with many tons of lead and a store of equipment. It required much reiteration on the part of Winters to convince his companions of the truth of his story. What finally convinced them was the sight, through a fluoroscope screen, of Winters' anatomy. There was unmistakeably an organ no longer present in the bodies of modern human beings—an appendix. He told them of his former awakening 5000 years ago in the age of Tree-crops and how he had been sentenced to death as a representative of what they then called "the age of waste"—the twentieth century. He wished his entire story kept absolutely secret, although both Steuvlen and Clethra assured him that now the world had succeeded in perfecting atomic power and synthetic food such economic questions had been long forgotten.

● Together the three commenced digging the tunnel with an amazingly adaptable digging machine—scarcely five feet high—which scooped out the dirt and sent it flying under the terrific impulse of its tiny atomic motor. When the work had proceeded some distance they erected a tent over the mouth of the hole and returned to the city to bring back four skilled mechanics blindfolded. Not until they were inside the tent were the bandages removed from their eyes and, willingly enough, they continued the construction at a rapid pace. In a week all was finished to the last detail and the men were again blindfolded and led out, into the airship and back to the city.

In the meantime Winters had prepared a strange book. The leaves were of sheet gold and hinged at the back. It contained two hundred pages and was very heavy but had the advantage of great permanence. On this he wrote with hydrochloric acid, using a glass stylus for a pen. Here follow some of the notations he set down:

1950 A. D.—a world based on private advantage and dependent upon natural foods entirely. Human nature still savage, but mentality very advanced.

3000 A. D.—approximate date of the great revolution which overthrew tribal government and private hoarding. From here dates the human race as a single unit speaking one language and with its chief aim the reduction of work hours required to maintain the people in comfort. From here dates a change from using plants and grains for food to the use of tree fruits and crops.

5000 A. D.—date of Winters' first awakening. He found a civilization whose chief political credo was economy and went on to observe future ages. This is described elsewhere.*

6500 A. D.—date of the first practical use of synthetic food. The country becomes deserted and cities multiply. Cities are no longer dependent on the country districts for supplies.

7000 A. D.—About this time came the discovery of atomic power and the first practical engines based upon this principle. An era of enormous prosperity and scientific advance.

7100 A. D.—The first expedition lands on Mars and returns, reporting it habitable but not nearly so pleasant as the Earth. From here date several expeditions into space. Mars and Venus explored, mapped and several interesting forms of life brought back. No new or important minerals, except radium on Venus in vast quantities but so scattered as to be difficult to mine.

8000 A. D.—Professor Stannard demonstrates the mechanical brain. This was originally a machine with an electric scanning eye recording its observations on magnetic tape (principle of Poulsen's telegraphone of early twentieth century). Thought associations were produced by shape, color and general appearance and demonstrated by the machine on a numbered board. It caused much excitement and a dozen independent workers within two years had adapted the principle to the senses of sound, taste and feeling. The separate machines were brought together and a vocabulary set up on sound recording tape and about 8050 the mechanical brain existed as a thinking, speaking entity.

8200 A. D.—The mechanical brain now developed enormously and used to judge law cases and answer difficult questions.

8500 A. D.—The council of educators in control of the world and guided by the decisions of the Brain.

9000 A. D.—A revolt by the Educators to regain the power which the Brain had gradually taken over from them. The Brain and its defenders were prepared with deadly scientific weapons and the revolt was suppressed with great loss of life.

9500 A. D.—The last of several uprisings against the Brain. Suppressed with great loss of life and many people escape into the wilderness. From now on the course of history is stable. The Brain is constantly strengthening its position in the world and seeking to bring the last human beings in from the wilderness to avoid any possible uprising from without.

10,000 A.D.—The destruction of the Brain and the recommencement of the human race's efforts to improve its own mentality and physique. This is the date of Winters' second awakening.

And now came the day that Winters had set for his departure—his "burial" as Clethra sadly termed it. He made a last inspection of his chamber. It was fifty feet below the surface of the ground and lined with six feet of lead as before. But his clock was run by radium and a checking clock was set up run by the temperature difference between winter and summer. A great battery of

*Wonder Stories for March, 1932.

X-ray and violet ray lamps lined the ceiling and were to be operated by an atomic motor, which ran continuously and would so run for five thousand years upon the power furnished by a pound of powdered calcium.

Above his couch was a glass container filled with a specially prepared liquid food and tonic. A synthetic rubber—imperishable—tube led from this down to the couch and would, when he went to sleep, be fastened to a mask over his mouth. Upon waking he would have merely to swallow, for the clock would automatically start the liquid running at the proper time—a few hours after the lights had been flashed on. Winters examined everything with great content and looked forward to his next awakening with impatience. He was getting on in years, he thought to himself, and this sort of thing could not continue indefinitely. It therefore behooved him to waste none of his life-span yet remaining.

Nevertheless, it was with real regret that he said his farewells. The tent had long since been removed and the hole hidden cunningly with growing shrubs. The airship that was to take his companions back to the city stood close by ready for the flight.

"A good voyage to you," said Steuvlen. "Or should I perhaps say sweet dreams!"

"Good-bye! And you too, Clethra!"

"You are surely not sorry to see the last of me!"

"I am most certainly sorry. Why not?"

"Don't you remember how hard you tried to avoid me in the beginning?"

"How foolish I was!"

"There! You are forgiven. But I must kiss you once just to prove that no man can escape when a woman has decided to pursue him!"

He watched the airship rise into the sky, now darkening with the purple glow of sunset, and set off eastwards into the approaching nightfall. He stood a half hour gazing after it, thinking sadly of his lonely future. When he awoke these people would be dead and the very city they lived in, perhaps, a forgotten ruin. Might he not after all be happier to remain here? Then his thoughts went back still further to his own age eight thousand years ago. Had he realized how irrevocable a thing time was, would he ever have started on this Odyssey through the millenniums? Once gone, time was forever gone—a memory—a nothing. He could not go back; there was nothing left but to go forward, friendless and forlorn though he might be. Somewhere, he thought with a sudden surge of hope, somewhere in the dim future there must lie an answer to the enigma of life. He would find in it his reward. But whether or no, what was past could never be brought back. He thought of the lines of the Persian poet:

"The moving finger writes and, having writ,
Moves on. Nor all your piety and wit
Can lure it back to cancel half a line.
Nor all your tears wash out a word of it."

And now the light went out of the sky and the stars appeared—old familiar friends, though even they had been altered slightly by the inexorable march of the equinoxes. The moon was rising early that night and silhouetted against its glory the dark figure of Winters could be observed as he squeezed among the concealing shrubs. He vanished from sight and the sound of the capstone being moved in place was audible at a few feet distance. Then the moon rose stately and cold and shone down upon that empty wilderness as she had shone for centuries and as she would continue to shine for yet untold eons of time.

THE END

What Will Future Mankind Look Like?

● RESEARCHES among the college youth of America show that they are larger than their parents, and especially taller. Suppose this growth to be continued at arithmetical progression for a couple of hundred years; the descendants of the men and women of today will be giants. If it were continued for twenty thousand years, the human race would be Brobdingnagian. Obviously, it can't. But what will the human race look like in the far future?

Nature does not abhor a vacuum—in fact, nature's favorite field of operation is a vacuum. Nature seems to regard matter as dirt to be swept into a corner.

Electricity travels fast, you have heard. One of the greatest modern physicists says that the electrons in an ordinary light wire travels 7½ inches a minute.

Will future generations use a disintegrating ray? And why not?

These questions, and many more curiosities and oddities of today's science, are discussed in the April issue of

NOW

15c

EVERYDAY SCIENCE AND MECHANICS

Look for it on your newsstand.

(Illustration by Paul)

The dust was so fine it was impossible to walk without slipping. They all walked with heads bundled in gauze, and each with his hands on another's shoulders.

GIANT IN THE EARTH

By MORRISON COLLADAY

● There are untamed forces within the earth, of which we know nothing. Only when earthquakes rock nations, and volcanoes smother cities under hails of fire and lava, do we appreciate the power of the "giants in the earth."

Mr. Colladay, in his usual realistic manner, has chosen a theme from the many possible showing what might happen should such a slumbering giant force awaken, and begin to take an interest in our earthly affairs.

We don't want to give away his neat story by telling what that force is, but we warrant that his explanation of it is convincing and plausible. We hope, however, that we never will be called upon to face the crisis that he so vividly pictures.

● The reporters gave Gary and me credit for discovering the cause of the mysterious epidemic which was devastating the thinly settled mountain region of North Carolina. Probably it made a good newspaper story to have two medical students succeed where the leading physicians and scientists of the nation had failed.

As a matter of fact, I had nothing to do with it. It merely happened that I was with Gary on the Sunday afternoon tramp when the sight of the destroyed vegetation in the mountain valleys suggested to him the idea which put the United States Public Health authorities on the track of the cause of the epidemic.

The epidemic seems comparatively unimportant now, but that is only because it was less spectacular than what happened later. If the authorities had known at the beginning what it indicated, the outbreak of the disease would have been a signal for the immediate evacuation of that part of the country and the consequent avoidance of a terrific loss of life.

Nobody remembers when the first cases of the mysterious disease were noticed. A few patients were brought to the Asheville hospitals from the surrounding mountain valleys with a peculiar skin eruption over their entire bodies, almost like severe sunburn. Within a few days all had died and as more and more cases came to Asheville, the local health authorities became alarmed. There was no question that the city was faced with the possibility of a serious epidemic.

The North Carolina health department immediately established a quarantine of the affected regions, and several of the great summer hotels in the mountains were converted into hospitals. Soon the local physicians were overwhelmed with the extra work and called for help from other parts of the country. Gary and I were seniors in Medical school and jumped at the chance to get practical experience in fighting an epidemic, expecially as announcement was made at this time that the United States Department of Public Health was about to take over the job from the State and city health authorities.

When we reached Asheville we were sent on to Black Mountain, where a resort hotel was being converted into a hospital to care for the constantly increasing number of victims of the disease. It was a sufficiently unpleasant experience, even for medical students who are fairly hardened young men. Men, women and children were brought in in droves, looking as if they had been severely burned by the sun and running a temperature. The fever increased, they became delirious, their flesh began to slough away and in seventy-two hours they were dead.

This was the invariable course of the disease and nothing the physicians did had any effect. The extemporized graveyard in the soft earth at the foot of the mountain grew by leaps and bounds, but still the number of our patients increased; it looked as if the surrounding territory would be entirely depopulated.

One of the curious things about the disease that puzzled everyone investigating it was that not a single physician or attendant in the hospitals had been attacked. This fact, the explanation of which was so simple when the truth was known, was regarded as incredible then. Each day we were examined with the expectation that traces of the disease would be found in some of us.

When we were all found well, it was taken to mean that the period of incubation was longer than expected. Naturally the doctors, attendants and nurses were careful, but we all felt sure that some of us would become victims and we went about our work a good deal like soldiers in a battle.

● The story of that Sunday afternoon walk when Gary and I found the valleys with the blasted vegetation was good newspaper stuff and the reporters gave their imaginations full sway. As a matter of fact, nothing sensational occurred, in spite of the newspaper accounts, and I doubt that we were ever in serious danger. The walk derives its only importance from what it led to.

For Gary and me it started off like any other climb, through the mountains. We not only had no idea of hunting for the cause of the epidemic, but we were trying for a few hours to forget that it existed. We had tramped for several hours before the blighted vegetation of the valleys attracted the attention of either of us. Most of the time we kept to the ridges of the mountains, but the blackened lowlands were always plainly visible.

Finally as we were crossing a narrow valley to reach the next ridge, Gary stopped to examine a thicket of shrivelled underbrush.

"What's happened to all the green things?" he asked. "Looks as if there'd been a heavy frost."

I laughed. "Frost in July? It's funny, though," I added, looking around. "There isn't a green leaf until you get a thousand feet up in the mountains. See that line up there?"

Gary gave one look and then he seized my arm. "Come on. We're getting out of here."

"What's the hurry?" I protested.

"Don't waste time talking," he answered, and I noticed his face was white. He plunged up the side of the mountain and I followed. When we reached the limit of the killed vegetation we saw there was a space of a few feet where the plants were yellow and dying. Above was the flourishing luxuriant green of a midsummer Carolina mountainside.

We had not wasted any time climbing the mountain, and I threw myself on a patch of grass to get my breath. Gary was staring down into the valley which looked as if fire had swept through it.

"Pretty near all our patients come from valleys like this, don't they?" he asked finally.

"I guess so," I answered. "They can't live on the mountains very well. Not much water and they'd freeze to death in the winter. Besides, they've got to live where they can grow things."

He nodded. "That's about what I figured, though I don't know the country as well as you do. I notice all the hospitals are pretty well up in the mountains."

"That's because the government is using resort hotels for hospitals. Tourists always want a view when they come to the mountains." A sudden thought struck me. "You mean the same thing that blighted the vegetation might have caused the epidemic?" I asked. "That's the reason we hurried up here?"

"Suppose it isn't an epidemic at all," he said slowly. "Something killed everything in the valley down there. The cases come from places like that. Although the disease is virulent, not a single doctor or nurse has contracted it. They're all living up in the mountains. It looks to me as if it might be a poison of some kind that's killing off the natives."

"Where could it come from?" I asked. "Besides, I don't believe there is any poison that would kill people just that way. If they didn't all die immediately, some of them would get better. None of these cases do."

"What about radon?" asked Gary.

"Radium gas? I suppose it might, if it was concentrated enough. Old Ames in chemistry lab used to say a cubic centimeter collected in a test tube would melt the tube. Yes, it's a beautiful theory," I went on. "There are only two objections to it. There isn't enough radium in the world to kill off the vegetation in this one valley. The other difficulty is there isn't any radium in this part of the country."

Gary nodded. "I know. Nothing east of Colorado. But suppose that's all wrong. Suppose there's radium under these valleys now, even if there wasn't any before."

"It doesn't sound sensible to me," I said.

"Maybe. But it won't do any harm to be sure. Some of these public health men are sure to have electroscopes. I'm going to see Grant tonight."

Physicians In Conference

● The local and state health departments had broken down so badly under the strain of fighting the mysterious epidemic that the United States Department of Health had assumed practically full control of the affected regions some time before. Assistant Surgeon-General Grant, a thoroughly trained epidemologist who had had a wide experience both as a research worker and executive, was in charge. He reached Asheville with a full staff of medical men, sanitary chemists, sanitary biologists and sanitary engineers. He made his headquarters at Grove Park Inn, which the government had commandeered and was using as an isolation hospital.

Here late that night Gary and I found him. He had just gone to bed but we sent word that our business was too important to wait until morning.

I let Gary do the talking. When he finished, Dr. Grant gazed at us in frowning thought. Then he offered the same objections I had.

"I don't say it's radium," insisted Gary. "All I'm suggesting is that if these patients had been exposed to enough radium, it would account for what's happening to them. It might be some other radioactive gas that has been released in these valleys."

"You boys wait for me in my office downstairs," said Dr. Grant. "I'll be dressed in ten minutes."

A good deal of the newspaper publicity Gary and I got was propaganda frankly put out by Dr. Grant to justify his orders for the complete evacuation of the city of Asheville and a large part of western North Carolina. There is no limit within reason to the power of the public health authorities in an epidemic. They can take any measures they think best to prevent its spread.

When the public health department engineers found radon in fairly high concentration in the low-lying valleys, Dr. Grant acted with military promptness, in spite of the protests of the Asheville authorities, backed by the local physicians. The average physician is a conservative person, to characterize him mildly. The history of medicine shows that every new idea has been fought bitterly. The theory that our patients were dying as the result of exposure to radon was no exception.

I remember what occurred at a conference of doctors called by Dr. Grant the evening following our visit to him. During the day he had satisfied himself that Gary had accidentally stumbled upon the cause of the disease that the scientists of the department had been desperately seeking.

The physicians were assembled in one of the parlors of Grove Park Inn. Dr. Grant presented the evidence he had gathered and announced that the evacuation of Asheville would be ordered the following day as a protective measure. There were immediate protests from a number of men present. One of the leading doctors of Asheville was particularly indignant. I have no desire to hold him up to ridicule, so I shall call him Dr. Brown, though that is not his name.

When Dr. Grant had finished talking, Dr. Brown got pompously to his feet. "I think I can speak for the Medical Society of Buncombe County when I say that they will oppose any effort to evacuate the city of Asheville. We are practical men and we don't take much stock in half-baked theories. Even if what you say these young men discovered is true, it has no practical interest, so far as I can see.

"If there's radon or whatever-you-call-it coming from these mountains, I guess we'll have to let it keep on coming. If people can't live in these valleys, there's a lot more of North Carolina where they can live. There is

certainly no reason for doing such a foolish and unheard-of thing as driving all the people in a city of sixty thousand from their homes."

"Ah, but that's just it, Dr. Brown," replied Dr. Grant. "How do we know that the rest of this section won't be affected as these isolated valleys have been? Whatever is causing the epidemic, it is certainly spreading. This week we have received cases from the outskirts of Asheville. Remember we have a mortality of one hundred percent. Think what it means if the disease actually attacks Asheville!"

Dr. Brown reddened angrily. "You government men are always inclined to exaggerate things. I have a communication here from the Chamber of Commerce, protesting about the interviews you have given out. You have practically killed our tourist traffic and caused our merchants and hotel keepers great loss. After all, things aren't as serious as you make out. Before we get through, we'll doubtless find the so-called epidemic is a deficiency disease, probably a form of pellagra."

CHAPTER II
"Evacuate The City!"

● Before relating the controversy between the United States Department of Public Health and the North Carolina authorities, it will be well to outline the conclusions of the department scientists, which were the justification for the stern and drastic control measures put into effect by Dr. Grant.

The reason scientists did not discover what was really happening in western North Carolina until Gary and I stumbled on the devastated valleys, was astonishingly simple. Radium had always been found associated with uranium in proportion of one part radium to three million parts of uranium by weight. No trace of uranium had been discovered in the eastern United States.

If the curious epidemic had started in Colorado where the carnotite ore of Paradise Valley was the chief American source of radium, physicians would probably have become suspicious as to its real cause immediately.

It was true that a man named Holzberg out in California had recently extracted radon, radium gas, from granite rock with an electrical furnace, but no one realized until after the catastrophe of July thirtieth that this work had other than scientific interest.

Until this occurence practically settled the question, scientists were divided into two schools differing as to the amount and location of radioactive elements in the earth's mass. One school believed that they existed in comparatively limited quantity in the earth's crust. They pointed out that radium is continually emitting heat at the rate of 132 gram calories per hour per gram of radium. That is, it would heat its own weight of water through 100 degrees C. per hour. Therefore the heat of the earth would be maintained if radium existed only to four parts in one hundred million, million. It followed in their opinion that the amount of radium or other radioactive matter in the earth could not be greater than 270,000,000 tons or the earth would be growing hotter.

The second school of scientists did not dispute these figures, but they believed the conclusions drawn from them were false. They maintained that radioactive substances occur in great quantities through the mass of the earth and that the heat of the earth periodically increases until something occurs which acts as a safety valve. They offered as evidence the explosion of Krakatao, the Katmai eruption in 1912 and the South American eruption of 1932. They called attention to the fact that similar catastrophes may occur in any part of the world, including the Antarctic continent. If they occur in sparsely settled parts of the earth they attract little attention, as witness the blowing up of one of the Aleutian Islands in 1930, about which ninety-nine persons out of a hundred have never heard.

The reports of the government scientists made immediate action by Dr. Grant imperative. They not only found radon in all the valleys from which the epidemic patients came, but they found that instead of diffusing, its concentration was becoming greater and was rapidly covering new territory. As the period of activity of radon is very short, this indicated the presence of radium in quantities never dreamed of and of which there had been no previous indication.

How this was possible, they made no attempt to explain. They reported conditions as they found them and Dr. Grant acted without attempting any theoretical justification.

The newspapers were ordered to publish the evacuation orders, and it became evident immediately that there was going to be trouble. One of the Asheville papers made no comment on the order, but the other published a violent attack on what it called "the illegal and arbitrary acts" of the department of public health.

It became evident within twenty-four hours that it was not going to be possible to evacuate the population of the city peaceably. The governor of North Carolina was urged to declare martial law but refused. Then the alarming situation was brought to the attention of the President of the United States by the Surgeon General in Washington, after a long telephone conversation with Assistant Surgeon General Grant. I imagine that the matter was put quite strongly, because results were immediate. By noon of the next day all of western North Carolina and portions of South Carolina, Georgia and Tennessee were placed under military rule, thus establishing a precedent that will doubtless be useful if similar situations should arise in the future.

● There was a general reorganization of the quarantined area and most of the volunteer workers were dismissed. Gary and I were ordered to Asheville to help in the tremendous job of moving without delay sixty thousand men, women and children from their homes to other parts of the country.

I am not going to say much about this work, which was largely routine as far as we were concerned but which kept us busy fourteen hours a day for the next few weeks. The problem was complicated by the reluctance of people in other parts of the country to receive the evacuated ones, especially after a few cases of the scourge developed among the refugees. The discovery that the scourge was not a disease in the ordinary sense of the word but the effect of exposure to radium emanation made not the slightest impression on the average unscientific person. There is nothing to be gained by dwelling on this feature of the catastrophe, which resulted in great numbers of helpless women and children being isolated outside towns without food or shelter.

As the evacuation proceeded the number of new cases dropped. Antagonistic elements took advantage of this apparent improvement in the situation to make savage

attacks on Dr. Grant and the public health service. If Congress had been in session, the position of the government officials would have been very unpleasant.

As it was, with the President strongly supporting the health authorities, the opposition could not do much except talk. However, the attitude of the officials of the four states involved encouraged armed rebellion by some elements of the population who had been removed and now attempted to return to their homes. A few soldiers were injured and more civilians. The situation was becoming aggravated and there would undoubtedly have been considerable bloodshed if it had not been for the events of July thirtieth.

By that time the white population of Asheville had been largely removed. A great deal of difficulty was experienced in finding localities to which it was possible to transfer the large numbers of negro inhabitants of the city. As a result they were the greatest sufferers in the catastrophe.

Gary and I had accompanied a trainload of refugees as far as Greenville, South Carolina, on the morning of July thirtieth and were on our way back to Asheville. The train was pretty well filled with relief workers and army officers who were returning to their jobs.

We had just passed Hendersonville when the first shock occurred. Gary and I were sitting on the observation platform at the time. There has been a good deal of discussion since as to whether the volcanic eruption or the earthquake came first, and what I have to say will not throw any new light on the matter. In fact, it is a little difficult to describe exactly what happened.

The train was running as usual at a comparatively low speed through the mountains when suddenly there was a roar that seemed to drive air under great pressure into my ears. That's the only way I can describe the sensation, though I don't suppose there was any actual increase of air pressure at the distance we were from the scene of the explosion. Besides, there is no reason to suppose that any increased air pressure as the result of the explosion would travel at the identical rate of sound waves, and therefore reach an individual at a distance simultaneously with the noise of the explosion. That being the case, Gary and I decided that the effect of which we were both conscious must have been subjective.

The train seemed to strike an obstruction, though no evidence was found afterward that it had done so. The engine left the rails, carrying with it the tender and baggage car, and plunged over the embankment to the ravine below. Fortunately the coupling between the first and second cars broke loose, or this account would not have been written. The cars remaining on the track swayed sickeningly from side to side and came to a stop.

All this occurred in a fraction of time so small that Gary and I, thrown from our chairs on the platform, had hardly any consciousness of duration. One instant we were sitting there calmly smoking our pipes and the next we were picking ourselves up while the events I have described belonged to the past as a flash of lightning does.

The cars emptied themselves of their terrified passengers who crowded to the edge of the ravine over which the engine had disappeared. Nothing was visible in the darkness below except a spot of light like a bonfire.

"Not much chance for the poor devils," said Gary.

I suppose at least fifteen seconds elapsed after the tragedy, possibly longer, before any of us became aware of the terrific phenomena of the eruption. I have no idea how to explain this. At the instant the upper half of Mount Mitchell was blown off, the entire northern sky became a mass of livid purplish flame. Nothing like it has taken place in historic times except the explosion of Krakatao.

The explosion was heard a thousand miles away and the light in the sky was visible from New York. Yet the group of men and women who tumbled out of the cars only a few miles away from Mount Mitchell, for at least fifteen seconds were aware only of the fact that their train had been wrecked and they had escaped death.

● The eruption has been described so often by eye-witnesses that I do not believe I have much that is new to tell, though I think comparatively few people survived who were as near the actual scene as we were. Why we survived when many victims were farther away than we from the mountain has been a subject of much discussion and has never been satisfactorily settled. In the actual zone of destruction the victims were killed by the wave of heat which swept down on the surrounding valleys and shriveled every living thing in an instant. Many thousands at more distant points were instantly killed by a blanket of poisonous gas. Still others were apparently killed by the concussion of the explosion—at least they were dead with no trace of visible injury.

It may have been the configuration of the valley through which the railroad ran that saved us, though that theory is advanced simply because no one has thought of a more plausible one. At any rate, except for the engineer, fireman and baggage man who were carried down into the ravine, the passengers on the train were alive and uninjured. We now gazed speechless and awe-stricken and nearly blinded into the sky where flames like rushing clouds in a hurricane were roaring from a white-hot furnace which seemed to be consuming the mountains to the north.

Though the entire sky appeared to be filled with flames, we felt no sensation of heat. This was contrary to the experience of other survivors who were farther from the scene of the eruption than we were. It has been since suggested by scientists that the effect of flames overhead was caused by waves of incandescent gas which traveled great distances before the reduction of temperature caused them to lose their luminosity.

Our situation was not pleasant, marooned in the valley with no knowledge of what had happened a few miles away or what might befall us in the next few minutes. A hasty council of war was held and the ranking army officer aboard the train, who happened to be the colonel of a regiment of South Carolina militia, was given command of the group.

Colonel Gooden proved himself a good executive and within half an hour a handcar discovered by the roadbed had started back toward Spartanburg in search of an engine. There was nothing for the rest of us to do except wait and watch what was probably the most gorgeous fireworks display ever seen.

It was growing light in the east when we saw the headlight of a locomotive approaching. It proved to be a freight engine which our handcar expedition had encountered some distance down the line.

It had been drawing a heavy train and was far enough away from the explosion so it was not derailed. The en-

gineer realized that there was something seriously wrong ahead and had stopped until he got further orders. There was a signal station half a mile away, but the telegraph operator was on duty only during the day. None of the train crew knew anything about telegraphy, so they welcomed our handcar men with open arms when they found one of them, Lieutenant Palmer, was an army signal corps man. He quickly got into communication with the railroad divisional headquarters, which had been making wild efforts to get a response to messages from the towns in the region of the catastrophe. The commercial telegraph services had gone dead at the moment of the explosion. Lieutenant Palmer told the little he knew and then asked that the engineer of the freight engine be instructed to proceed to our train.

There was no difficulty about that, but the question then arose as to whether the passengers wanted to return to Spartanburg, the nearest railroad junction outside the immediate danger zone, or whether they would want to proceed, if that were possible, to Asheville.

Lieutenant Palmer was unable to answer this question, and it was decided to send a rescue train for those who wanted to return and for the freight engine to push the cars of our train as near the danger zone as it was possible to approach.

As it happened, everyone on our train decided to go on. A hasty vote was taken on the arrival of the freight engine and I suppose the few who would have preferred to return to safety hated to announce the fact in view of the attitude of the majority.

It was broad daylight when the freight engine began to push our train forward at a speed no faster than a walk. There was every likelihood that the tracks had been spread or torn up by the force of the earthquake, and the train crew was not taking any chances. Two of them were stationed on the front platform of the forward coach, giving the track ahead the keenest scrutiny and ready at any suspicious appearance to pull the signal cord.

The rest of us had to be content with putting our heads out of the windows to watch the mountains in the north blazing like a gigantic funeral pyre for the world.

We stopped ten times in the first five miles because of twisted rails, ties torn up or rock slides. The train crew would run ahead with shovels and sledges. After fifteen minutes or half an hour they would climb back aboard and we would begin again to creep slowly forward.

Shortly after noon the train approached the Asheville station, which is a mile or a mile and a half below the town. We poured out of the cars, surprised and delighted that the city had not been destroyed. We realized at once, however, that there was something wrong. There was not a person in sight and not a sound to be heard.

It was surprising how little damage the earthquake or shock of the explosion had done to the city. The skyscrapers had suffered most, their walls having been shaken off, leaving their gaunt steel frames still intact. We had become more or less used to the wall of solid flame in the north and the incandescent clouds racing overhead. As I describe the scene I am aware that it doesn't seem the sort of thing to which anyone could become accustomed, but we had been watching it for well over sixteen hours. I think most of us had expected to find nothing but burned-over ruins of a city, but the flames had apparently not reached Asheville, even at the moment of the explosion.

CHAPTER III

The Dead City

● Still we were prepared for tragedy long before we reached the main business section of the city. I suppose, including the relief workers and the citizens who had not been evacuated, there must have been at least ten thousand persons still in the city when the catastrophe occurred. As we tramped in a long straggling line up the hill, not a soul greeted us.

Gary and I were near the head of the procession with Colonel Gooden whose face was becoming more and more grim as we advanced.

"Looks bad, looks bad," he muttered, half to himself. He turned to us. "Take a look in some of these houses, boys, and see what you find. Break in if you have to."

Off to the left was a group of negro shacks from which we knew the inhabitants had not been removed up to the time we had left the city the previous day.

The front door of the first one we approached was unlocked. I pushed it open. There was only one room with a lean-to in the rear used as a kitchen. Two women and a man were in the shack. They didn't look up or move when I opened the door. After a moment I went over and touched the face of one of the women. I knew before, but I wanted to make sure.

We looked in half a dozen more of the houses and found men, women and children. They had apparently died in an instant, and though the bodies were not distorted in any way, there was something horribly eerie about the rigid forms frozen into immobility at whatever they were doing.

We caught up with Colonel Gooden a couple of blocks farther on. He eyed us keenly.

"Still there?" he asked.

I nodded.

"Need doctors?"

I shook my head, still not entirely trusting my voice. A good many of my friends had been in the city yesterday.

"Gas!" exclaimed Colonel Gooden. "That's what killed 'em in Martinique." He turned to Lieutenant Palmer who had been listening. "You've got to get the news out, Palmer. God, what a calamity! Hundreds of army officers and doctors wiped out in an instant, not to speak of the others."

"Maybe it won't be as bad as that, colonel," suggested Lieutenant Palmer.

"Don't fool yourself. We won't find a human being alive. You mark my words."

A minute or two later Lieutenant Palmer handed Colonel Gooden a strip of tape from the machine.

"Who are you? Where did you come from? Who is commanding officer? Emory."

"Who the devil is Emory?" snapped Colonel Gooden.

"War department," answered Lieutenant Palmer. "Don't mind him. I'll explain matters."

"All right," growled Colonel Gooden. "Tell 'em we're in a damn ticklish position here ourselves."

As Lieutenant Palmer turned back to the transmitter, Colonel Gooden, who had been glancing anxiously out of the window at a darkening sky, went to the street. Gary and I followed him.

There was a distinct change in the appearance of the sky. The great rampart of fire still blazed in the north, but the flame-like clouds racing overhead perceptibly

darkened. We could get an occasional glimpse of the sun, but instead of being its natural color it was a bright blue and the light that came from it seemed to be blue. So far there had been no sign of ashes. They almost invariably accompany vcolcanic eruptions from the beginning, but if there had been any, they were carried in other directions.

Now the darkening of the sky made us think there was to be a new development, particularly as violent electrical discharges began about the time we reached the street. A moment later a light gray dust as fine as flour began to sift down from the air. At first there wasn't much of it, but soon it began to fall faster.

● Even the buildings across the street we now saw through a heavy gray fog. The glare of the flaming mountains in the north became a dull purplish red and instead of extending across the horizon, was concentrated in four columns of fire from which rolled unbelievable clouds of black smoke. Something in the volcanic dust strained out enough light rays so that what was just a glare of flame at which it was impossible to look steadily resolved itself into a picture which doubtless represented reality.

Colonel Gooden rushed back into the telegraph office.

"Tell Washington it's getting worse here," he instructed Lieutenant Palmer. "Dust is beginning to fall. Four volcanoes in violent eruption in the north. Useless to try to get nearer. Probably dangerous to stay in Asheville. . . . Get that off," he ordered. He turned to Gary and me. "Know where the rest of our party is?"

"Part of them at the General Hospital," I answered, "and the rest of them at Army Headquarters across the square."

"Tie handkerchiefs over your noses and go after 'em. Keep together, you two, don't get separated. Bring 'em here right away, all of 'em."

The dust was falling so fast that we could barely see across the street. Already it was several inches deep under foot. Even with handkerchiefs tied around our heads it was hard to breathe. Nothing was visible overhead now, and the eruption in the north had become just a faint red glare.

The dust was so fine and soft that it was impossible to walk rapidly without slipping. Gary spied some messengers' bicycles in a rack and suggested using them. The dust didn't affect the bicycles and we could have made good time if we had been able to see where we were going. As it was, we had to follow the curb slowly, even though there wasn't any traffic to interrupt us.

The doctors and nurses who had gone to the hospital were gathered on the first floor in anxious consultation when we arrived. They had found no one alive and they were beginning to get alarmed for their own safety. We delivered the colonel's message and then led the way to the telegraph office, walking our bicycles. By this time it was almost entirely dark outdoors. The others followed with their heads bundled up in gauze and each with his hands on another's shoulders. The track of our bicycles was still visible as a depression in the rapidly deepening dust.

Some of the women were pretty nearly all in by the time we reached the telegraph office, and the men weren't very spry. Taking heavy physical exercise while you're breathing through a towel isn't anybody's idea of fun who has ever tried it.

Gary and I didn't wait to find out what orders had come from Washington, but started off again for Army Headquarters. This was a hotel which had been taken over by the government and was in the opposite direction from the hospital and slightly down hill. We were able to let our bicycles coast most of the way, but when we came to a level stretch, the dust had become so deep we had to abandon them.

We staggered into the lobby of the hotel almost smothered. The handkerchiefs had become so clogged with dust that it was almost impossible to breathe through them. One of the medical officers quickly mixed up something which he made us drink. I don't know what it was, but it made me feel all right again.

The officers gathered in the lobby of the hotel looked dubious when I told them that Colonel Gooden wanted them to come to the telegraph office.

"What does he want us to do when we get there?" one of them asked.

"He didn't say. He's waiting orders from Washington, I think."

"I don't believe we can make it," said the officer, glancing through a window at the falling dust.

"No use staying here," said the man who had given us the medicine. "It's getting worse instead of better. What about trying gas masks?"

That suggestion was what saved all of us. It was just a chance that they would work. They had never been intended to strain out dust and it seemed likely that they would clog up and be worse than useless. However, it was our only chance. We sallied out looking like immense beetles and carrying enough extra masks to supply the people at the telegraph office.

● It was pretty unpleasant the first few minutes, wondering whether we were going to smother to death or not. Then we found we could breathe fairly well—not comfortably, of course, but a lot better than we had any reason to expect.

Again Gary and I took the lead and this time we got lost going across the square and couldn't find the street which led to the telegraph office. It doesn't sound reasonable to us now, but we went entirely around that square twice without seeing a street that looked like the right one. It is impossible to convey an idea of how dark it is when practically all light is blotted out. The officers had powerful flashlights, but they showed only a rain of falling dust.

Finally I stumbled over something and went sprawling. It proved to be one of the bicycles we had abandoned, now covered six inches deep. That showed us where we were, and not long afterward we reached the telegraph office.

The people there would have been glad to see us anyway, but the gas masks we brought gave them an additional ray of hope. Things did not look very bright for any of us about that time. Washington had instructed Colonel Gooden to evacuate the city, but that was easier said than done. Our train with the freight engine had been ordered to wait at the station, but getting there from the city proper was a problem. Walking that distance even with the gas masks would be impossible unless the dust stopped falling. We stood around while Lieutenant Palmer was getting more and more urgent messages from the war department. Finally he came over to where Colonel Gooden was talking to a group of regular army officers.

"Some guy at the war department just made a suggestion that might work. He says there must be enough cars parked in the streets to carry us all to the station."

"We couldn't go a block without the carburetors being choked with dust," someone objected.

"He knows that," answered Lieutenant Palmer, "but he says it's down hill most of the way to the station. He says we can coast after we get started."

We had our choice of dozens of cars that had been left in the streets by their owners. Some of them it was impossible to start and we didn't waste time on them. Presently enough were lined up to accommodate all of us. Headlights on full would penetrate the dust a dozen feet, and we planned to keep that far apart.

The first few blocks were the ticklish part. Some of the engines behaved nobly. Others died on us and the cars behind pushed. Batteries were used for purposes never intended by their makers. Finally we came to the down grade and then it was simply a matter of keeping the cars under control and not running off the road.

We found the train crew in the station discussing whether to wait longer for us or to save their own lives by leaving while it was still possible. The general opinion was that all of us who had left to go up to the city were dead by this time. The trainmen had decided to wait until ten-thirty and if we hadn't appeared by that time they would go. When ten-thirty came with no sign of us, the engineer insisted on waiting fifteen minutes longer. Said he had a feeling that we were still alive.

It was during the last few minutes of this fifteen that the first of our procession of cars ran into the station and smashed a waiting room window.

This time we thought we were on our way to safety and then we found we weren't. When the engineer pulled the throttle of his engine, the driving wheels began slowly to turn but the train didn't move. Sand, and we moved forward a few feet, when the wheels began to spin again. Finally the younger men piled out of the train and broke into a construction car that was on a nearby siding. Armed with shovels, we began laboriously to clear the tracks. It was necessary not only to shovel off the volcanic dust but even to sweep the tracks. The dust made the tracks as slippery as if they had been greased.

We did this for nearly half a mile until we reached the down grade. Throwing away our shovels and brooms we scrambled aboard as the train slowly gathered speed. Fortunately the engineer was an old hand on the run and knew the grades. He carefully regulated his speed and we were neither derailed nor did we stop again until seven minutes after three. After that hour there were no more railroads in that part of the country.

We were near the South Carolina line then and fortunately for us, in comparatively level country. We had left the mountains behind and were among rolling hills.

● I was dozing when the first shock came and instead of waking me, it became part of a nightmare. The second shock was only a few seconds later and overturned every car of the train. My elbow crashed through the window, cutting my arm but not seriously. A woman from the other side of the car was flung on top of me. At first I couldn't think where I was. Women were screaming and men shouting. I heard the sound of escaping steam. Then I saw Gary looking down at me through the window on the opposite side of the car, which was now directly overhead.

"You all right?" he asked.

"Sure. Help me get this woman out. She's fainted."

I managed to hand her to Gary and get out of the car myself before the third shock, which was the most severe of the series which continued for twenty-four hours.

I don't know that I can add very much to the accounts of the earthquake which have been published. It was the most destructive that has occurred during historic times and extended over a wider territory.

I was thrown violently to the ground by the third shock. I was dazed but did not lose consciousness. I remember every detail as plainly as if it had happened an hour ago.

The fall of dust had stopped and the great barrier of fire in the north illumined the country so the intervening mountains stood out against the sky like black silhouettes. The terrific twisting sidewise movement of the earth nauseated me, but I was watching those mountains when they began to slide.

That doesn't sound very thrilling as I write it, but it was thrilling enough to look at. The only thing I could think of was an extravaganza I saw at a theatre when I was a boy, where one scene melted into another before my eyes. That was what was happening now. I saw the sharp conical peak of a mountain begin to sway back and forth. Then it seemed to slide on itself and dissolve.

In a few seconds there was no mountain there. I rubbed my eyes and when I looked again, the peaks in sight were disappearing as if they had been melted into liquid and were running off.

I don't pretend to say what actually happened that night. What I am describing is what I seemed to see. How much was optical illusion I'll have to leave for others to decide. One thing we know. The mountainous country of western North Carolina and the adjoining states was levelled off that night into what it is now, a barren, rocky plateau with fumeroles, boiling springs, geysers and other evidences of volcanic activity not far from the surface.

None of the passengers on the train was badly hurt when it overturned, but we had no food and it was forty-eight hours before a rescue party reached us. They were not hunting for us because it was assumed we had perished. It happened that the members of our party were the only persons who had actually been in the devastated country to escape alive.

This isn't the place to go into the theories of what caused the disaster, even if they were better established than they are. It is sufficient to say that the now generally accepted scientific opinion is that the earth contains vastly more than the 270,000,000 tons of radioactive substances required to keep its heat constant. Periodically the increasing internal temperature causes an explosion. It is thought possible that the place of such explosions may be indicated in advance by the discharge from the earth of radioactive gasses, as was the case in North Carolina. Whether this is true will probably not be determined until after observations have been made covering a period of years.

Dr. Grant's insistence on the evacuation of western North Carolina undoubtedly saved tens of thousands of lives. He lost his own, but he would doubtless have considered that a small price to pay for what he accomplished. A monument has recently been erected in Washington to his memory.

THE END

(Illustration by Paul)

He stepped into the blazing sunlight. Hardly had the door closed when he extracted a box from his pocket and held it up in his gauntleted hand. The needle was motionless.

THE MOON MINES

By EANDO BINDER

● This author introduces himself to the readers of Wonder Stories with a smoothly flowing, exciting, and yet surprising tale of adventure on the dead surface of the moon.

Mr. Binder has captured the essence of an interplanetary tale—that the action shall depend upon the peculiar conditions of the locale chosen. So many authors write interplanetary tales that could just as well have happened in New York, or Montana or Central America. Mr. Binder's tale is a moon story, par excellence.

Trickery must be met with trickery, shrewdness with shrewdness, in the desperate games men will play with life and death on other worlds. These elements make this story a series of thrilling surprises from beginning to end.

● With a careless flip of his hand, Richard Harrington snapped the button of the visovox and aimlessly turned the central dial. Music, laughter, news items, and other entertainment were momentarily listened to, and then angrily forsaken. After much of such critical searching for something that suited him in his present mood, he finally brought forth from the ether the strains of a low viol, playing one of Victor Herbert's time-hallowed love songs.

His eyes lit up with pleasure and he snapped the button which controlled the visual circuit of the visovox. He could distinguish little on the screen till he turned out the lights in the room. Then, as distinctly as if he were present in person, the figure of the violinist appeared in the frame and played to soothe the moodiness of Richard. Well satisfied for the moment, the latter threw himself into a cushioned chair and settled himself comfortably. In five more minutes he had arisen, turned on the lights, mapped off the visovox petulantly, and stormed about the room.

"What in the name of the ten planets is the matter with me? I've got plenty of Credits*, am well fed, healthy, well established, have friends, and yet I can't seem to enjoy myself as other people. . . . I guess the L. W. tests** are right, all right. Restless nature, content only in times of danger, incapable of being geared into a clock-work life, possessed of a will of my own. . . .that's what they said about me. . . . I've got it! . . . I've got that urge again. . . .something is pushing inside of me. . . . I need change, action, hazard. . . ."

Richard Harrington was, although shorter than the average man, a good deal stockier than most. His broad back was most fittingly coupled with slender hips. His legs were well formed and sturdy. To the stranger, the first glance at his face gives an impression of stupidity. A second and closer glance reveals the shrewdness that lurks beneath the mask of stupidity. Large blue eyes were set beneath a broad forehead. There was a certain slowness in his gait and general behavior that covered up a natural ability to move very fast and surely when occasion demanded. A remarkable physical and mental control made of the man a forceful, not easily subdued character.

Harrington was far from serene and calm as he paced the parlor of his suite of rooms. The L. W. tests had revealed him as the typical adventurer. The socialistic government had placed him in the paths most suited to his temperament. That was ten years before.

"Curse these S. I. S.*** officials," he grumbled to himself. "They can't find enough for me to do. I haven't been on a commission for all of . . . let me see . . . two weeks now!"

It was really hard to fit a man of this type in the systematic social world of his century. The socialistic doctrine demanded that every soul do his share for the common good of all. The ordinary run of people were easily slipped into place by the intelligent leaders in the central government. Each had a natural bent, revealed by the infallible L. W. tests, and his future life was governed by the revelations of those tests.

But with some few, of which Richard Harrington was a notable example, there was trouble in adapting them in any line of endeavor. A six-hour working day, and a four-day week was almost the ideal existence for most citizens of the United Socialistic Republic, but to this man it would have meant the extinction of the best in him. His temperament could not be bound by such monotonous routine. He had imagination to a certain degree, mental dexterity of high quality, personality to a high degree, but counterbalanced by a terrific dislike for restraint of any sort.

There is hardly any doubt that if he had lived many centuries before, when there was no Bureau of Employment, he would have become a pirate; or, living in a later age, a gentleman outlaw. As it was, they made him one of the highly-honored S. I. S., and thus directed his independence to safe and beneficent efforts for the common weal.

His last thought, about the commission of such ancient vintage as two weeks, brought before his mind some of the events in the execution of his duty.

"So the Ginzies**** thought they could short-weight us by their faked eighty-eight standards? Thought an earthman couldn't understand their system, although it is as complicated as those whirly-brained fur-faces can make it. I had a great old time there holding up a shipment for

* "Credits" . . . the paper money of the time.
** "L. W. tests" . . . Life-work Tests given at the age of twelve.
*** "S. I. S." . . . abbrev. for "Special Investigation Service."
**** "Ginzie" . . . nickname for a Martian, considered an affront if used to their face.

two days while half the Ginzies in the place looked ready to murder me!"

Harrington, usually emotionally stable, chuckled out loud as he remembered the frantic entreaties of the exporters to let the shipment of radium go through.

"But now here I am again. In one day I had heard all the news, in two visited all my friends, in three ready to die of ennui. . . ."

Harrington mentally reviled the restrictions under which he lived. Free to come and go over the face of the earth at will, something few other people ever hoped for, he chafed that he could not speed out into space in search of the new, the exciting. But an S. I. S. agent must be within beck and call of the government that managed things for the good of all, at the slight cost of the personal freedom of the individual.

Richard had often wished he lived three centuries before when space travel had first come into being and before the advent of the U. S. R.* In those days, he told himself, a man got up in the world by his own ambition, not by the learned help of the Bureau of Employment. Richard, as is common with most discontented men of any age, had an idealistic conception of the "good old days" when a man was his own master.

● But it was not often that he got himself into such an unhappy, dissatisfied mood as on this night. Ordinarily the Bureau of Adjustment of the U. S. R. kept him busy to the saturation point of even his active nature. By dint of his extraordinary powers of sagacity, diplomacy, and ingenuity, each of which he was blessed with to a great degree, he had become one of the Service's most trusted and demanded agents for those tasks of adjustment in the affairs between the three worlds which required careful investigation. His weekly income of credits, translated into the money system of an earlier age, would have meant hundreds of dollars.

Harrington, about driven to distraction for want of suitable employment, was suddenly galvanized to attention. A buzzing had interrupted his hand as he was about to try again the visovox for entertainment. In a trice he leaped to his private telephone.

"Harrington speaking."

"This is headquarters. Report to Chief Wilson within the hour."

"Righto!"

With a slight smile on his calm face, Harrington, suitably dressed for an audience with his chief, left his rooms and headed for the "tubes." At the central terminal he mingled with the crowd taking a through train to the central part of Chicago. His apartment hotel was located far along to the north on the shore of Lake Michigan. With hardly a sound, the express gathered speed and shot southward. Through towering building after building it sped, never getting closer to the ground than the fortieth story, beneath which the locals hummed. Swinging idly in his compensating seat, Richard conjectured as to what the call was for.

"Must be something important. Never had a call on such short notice before. . . . usually give me a day or so. Wonder what they'd have done if I had been someplace else than here in Chicago? . . . . sent for me by special rocket service? . . . . maybe."

● In fifteen minutes he stepped out of the "tube," almost bowled over a tall Martian, and raced for the elevator to take him to the ninetieth floor. In more minutes he stood before his chief. After a brief bow, which always made Harrington feel humiliated, returned by a nod of the chief's head, he seated himself opposite the desk.

Chief Wilson of the Special Investigation Service of the Bureau of Adjustments of the United Socialistic Republic, to give him his full title, received his orders direct from London, in other words he was a "big shot," London being the seat of the central government of the U. S. R. Tall and spare, he had the demeanor of a hawk. Beady, black eyes peered from a shrewd face. Quick in all his actions and words, he kept an alert mind on the responsible activity of his agents. The Chicago Branch (number 3) of the S. I. S. had a world-wide reputation, largely due to Wilson's masterful supervision and the faithful services of such men as Harrington and others like him.

"Glad to see you, Harrington," the chief opened the conversation. "Hope you enjoyed yourself in the last two weeks."

"Well. . . . call it enjoyment, Chief, but. . . ."

Chief Wilson smiled. He knew his men, the man before him in particular. He was young, a mere twenty-five, but invaluable in the Service.

"Richard, I've got a commission for you. . . . of course. It's a little different from most of them. No doubt you have heard of the Moon Mines?"

"I have, Chief, although my complete knowledge of them can be compressed into the words: there are mines on the moon."

The chief nodded his head. Very few people knew much of anything about them.

"You will soon be gathering first hand data on that, Harrington. It's this way. The metals on the moon are chiefly of the platinum and rhodium series, with some gold. Consequently, the mines are valuable holdings. To familiarize you with your task there, I think the best thing to do will be to start from the beginning."

The chief composed himself more comfortably in his chair, and cleared his throat.

"Although there has been space travel now for three centuries and over, our own satellite was almost untouched till within the last fifty years. The first people to see commercial possibilities in mining on the moon, strange to say, were the Martians. They established themselves there quite firmly despite the terrific handicaps of a lack of atmosphere and the train of hazards which are a result of that lack of air. Forty years ago, at the close of the Two-World War, the military forces of our world decided to drive them off our rightful property. The armistice was signed before this was accomplished, but by agreement with Mars, the moon became unattached territory, to be exploited at will by either world.

"Today we find both the M. M.** and the U. S. R. operating there. Various stations have been set up by both governments, from which their respective mining operations originate. By mutual written arbitration, a section of moon-land is considered free for the taking till it is 'claimed.' Claims are filed and accepted by the joint inter-world Moon Mines Council *only* upon submission of ore samples which prove the claimed territory to be valuable. The number and size of the claims are also limited. This,

* "U. S. R." . abbrev. for "United Socialistic Republic."
** "M. M." . abbrev. for Martian Monarchy.

as is easily seen, prevents either government from annexing territory indiscriminately.

"The filing of claim applications, without going into detail, involves the exploration of the chosen spot by a mineralogist, assay of the ore samples he brings back, and accurate mapping. After the claim is acknowledged by the Council here on earth, work is begun in the tedious, dangerous way that obtains on that dead satellite.

"Four days ago a mineralogist left Station No. 7 on the Mare Nubium and never came back! We got the report by radio this afternoon."

Harrington, keenly alert now that he was engaged in a commission that held much promise spoke as Wilson paused.

"If the moon is such a dangerous playground, why should the disappearance of one man cause any uproar?"

The chief squinted his eyes. "Harrington, you're going to the moon to investigate the death or disappearance of Harvey Wood, their best mineralogist. . . . mind you, their *best*. . . . and it may be possible that the Ginzies are mixed up in this."

Richard Harrington was no fool. He could tell in the chief's tone that he was sure the Ginzies were connected with it.

"Now, Harrington, in the last three months there were three claims filed by our men and in each case there was found to be a Martian claim applied for *a few hours before*, just enough to beat out the U. S. R. applications!"

"And I am to find out if that is merely coincidence or. . . . ?"

"Exactly. Now, Harrington, let me remind you that as matters stand today between Mars and Earth, any little entanglement is liable to result in bad feeling and perhaps. . . . WAR! That means you must do two things: rectify the claim-jumping, and. . . . keep out of trouble in this matter of rectifying."

The trusted agent reflected a moment before speaking.

"Apparently there must be some underhand work going on, chief, not only by the Ginzies, but also in Station No. 7. Am I right?"

"Yes, except that there is no lawful communication channel between the Martians and our men supposed to exist. That, too, will bear investigating."

"I am to go as far as my duty demands without straining the thin web of a weak relationship betwen our two worlds."

"Right again." Wilson was tapping on the desk with a nervous finger. "Harrington, if ever you used diplomacy before, be sure to handle it with gloves in this matter. The M. M. is still touchy about that Foreign Rights on Earth affair, and it would be a blot on the name of the S. I. S. *forever* if war came of this."

"Then the M. M. is prepared to back up its interests on the moon?"

"Yes, even as the U. S. R. is prepared to back us up, Harrington, up to a certain limit. . . ." The chief's tone was apologetic and Richard knew that the delicate state of affairs betwen the worlds was bothering Wilson in no small degree.

"Is the head man of the U. S. R. moon mines . . . is he. . . . ah. . . . is there any possibility of his being connected in any way with the discrepancies?" Harrington hated to cast suspicion against a man he knew nothing about.

"Algaard Soderstrom, Overseer of Station No. 7, has held his position for over three years. His record is as yet untarnished. His zealous work has been all that a son of socialism can do to show his faithfulness to our government. More I cannot tell you."

"O. K. chief," said Harrington suddenly after a period of silence. "When do I start?"

CHAPTER II
Suspicions

● From the side port Harrington gazed with something akin to awe in his habitually placid features at the view he commanded of the luminary so much treated of in poetry and prose. Thirty hours before he had left earth with a song in his heart. His commission smacked of something he liked most. . . . danger. Once out in space, the space he loved so well for the promise of adventure it held, his boredom had dropped from him like a cloak, and the zest of life took its place. The sun's corona, the velvet-black sky, the unblinking stars; they were old friends of his. His tried and true ship carried him with unerring accuracy to his present goal. Thirty hours for a space trip is a short time, and Harrington was mildly surprised when he hove near the moon just as he had comfortably settled himself, so to speak.

After an admiring survey of the mottled surface he gazed upon for the first time in his life, at this distance, he backed away from the port and engaged in the important task of finding the location of Station No. 7. It was sometime before he managed to match the map spread before the engine panel with the topography visible to him, the while he kept a weather eye on the instruments to correct his deceleration at intervals. He easily located the Mare Nubium, once he oriented himself, and a half hour later found his ship just above the supposed location of Station No. 7. He landed his ship nearby the five-mile high precipice marked on the map as a landmark to that station.

He looked out of the ports on either side. To his left rose the precipice of which he could not see the top, its shiny surface dazzling in the brilliant sunlight. To his right the sands of an ancient sea stretched as far as the short horizon extended. To his right, but more toward the back, he could see the sharply-outlined peaks of a vast mountain range. Hardly an inviting scene thought the S. I. S. agent to himself as he carefully donned his vacuum suit.

He took one last look at the air gauges and heat indicator before he entered the little air lock next to the exit. As he opened the outer door, he heard the outrushing swish of the air, and then there was perfect silence. He jumped to the sand, careful to keep in the shade of his ship. He glanced at the air gauge embedded in the back of the gauntlet of his suit, adjusted the sun-shades before his eyes, then stepped away from his ship. Curiously he watched the thermometer which was next to the air gauge. From absolute zero it almost leaped up and up till it registered 375 degrees absolute.

The second lining of the vacuum suit radiated away the rest of the burning deluge of fiery rays from the unhampered sun; the inner lining, most peculiar of substances, "stepped up" the heat rays, which came to it, to unfelt rays on the borderline between those called "heat" and "radio" waves. Inside his insulating suit, the earthman could feel nothing of such terrific changes of temperature, although

he realized he was but a half inch away from frigid cold and burning rays and vacuum.

With a glance all about him, Harrington started to walk in the direction of the gigantic cliff near which he had landed. He knew that somewhere in the direction he was going, he would find the door leading to the caverns of Station No. 7. With more than half his weight lost* by reason of the lesser gravity, he moved rapidly across the sparkling gravel and sand of the dead moon, like a malformed gnome. He stopped once to adjust the air pressure which had become too high. There was nothing in the surrounding scenery to attract his attention, so he moved forward at a fast pace.

Finally he came upon signs of living things. Scattered here and there were various discarded mining implements, empty cans, piles of rocky ore-discards, and even rags and paper, all lying exactly as they had been placed or thrown, and doomed to lie thus till moved by human agency. Harrington was struck by the odd positions of some of the papers, unmolested as they were by winds of any sort. When he kicked them off the ground, they fell back like plummets and became again absolutely motionless. Richard shook his head. He had not experienced anything like this in his numerous sojourns on inhabited worlds. A short time later he saw the entrance to Station No. 7.

This entrance was cut into the perpendicular face of the precipice in a circular form. Indented from the rock was the steel door which sealed off the outer vacuum. As he approached the door, he looked for the handle his chief had informed him of. There it was to one side. He read the legend chiseled into the hard rock: "PULL THIS HANDLE FOR ENTRANCE. LOSE NO TIME IN ENTERING AS THE SEAL AUTOMATICALLY CLOSES IN TEN SECONDS."

Harrington, feeling like a knight of old challenging a strange castle's inhabitant to come out and fight, pulled the handle. Almost as quick as thought, the eight-foot steel section rolled aside to reveal a black hole in the cliff. He stepped in and seconds later the door rolled back into position. He was about to snap on his breast lamp, when before his eyes a neon sign leaped out of the darkness.

"CAREFUL! DO NOT REMOVE YOUR HEADPIECE YET. WAIT FOR THE SIGNAL!"

Of a sudden there was a rushing sound and Harrington knew that air was flowing into the lock. The sign faded and was replaced by one which read:

"WHEN THE DOOR OPENS WALK INTO THE NEXT CHAMBER."

Again a door rolled aside and Richard stepped into a lighted room with a painted sign on the wall of black rock:

"REMOVE YOUR VACUUM SUIT AND HANG IT UP."

● Back of him the second seal had closed. Harrington hung his suit beside the many that hung on the one wall. He pressed the button which was marked for the attention of visitors to Station No. 7.

Several minutes later a door opened and a man entered the room.

"Sun shine upon you, sir," smiled the newcomer in the universal greeting of the time.

"Fortune favor you," answered Harrington with a short bow. "I'm Richard Harrington. I presume Overseer Soderstrom is expecting me?"

"Yes, follow me, please."

They stepped out of the vestibule, as it may be called, into a long corridor cut from the living rock, as was all of Station No. 7. There was no other soul about. Some ways down the corridor, the man stopped before a doorway labeled "OVERSEER," pressed a button, and waited. When a little pilot light flashed above the door, he opened it.

The attendant announced him and then left the chamber by another door. The overseer of Station No. 7 arose from his desk and warmly greeted the visitor from earth. He was a large, jovial-faced man with a quiet voice. His almost obese body was clothed in a leathern outfit of fine quality and texture. His curly black hair fell over his forehead.

"Welcome to the moon, Mr. Harrington, but first of all let us proceed with the necessary ceremony of identification. You understand. . . . duty demands. . . ."

"Quite right, Mr. Soderstrom."

Harrington approached the overseer, bared the back of his left forearm, and gently blew his breath about midway between elbow and wrist. With startling clearness a blue seven-pointed star appeared on the skin, and Soderstrom turned away satisfied. Only the chemists of the S. I. S. possessed the formula of the ink which was colorless except under the influence of a person's breath. All S. I. S. agents carried this mark of identification on their left [illegible].

"And now have a seat, Mr. Harrington."

The other complied and glanced appraisingly about the small office. Except for the desk and several chairs, the place was devoid of furniture. However, it did not lack for pictures, drapes, and other beautifying articles arranged to suit the taste of the overseer. From the open door of the other room came the clacking of a typewriter.

"Cozy here. Especially in comparison to outside."

"Yes," laughed Soderstrom. "We are a very home-loving people, we miners on the moon, because there is so little to attract us out there."

"Quite so," murmured the visitor. "Don't you get a desire to go back to earth occasionally. . . . to see again a world of life and warmness, Mr. Soderstrom?"

The overseer's face became serious. "To tell you the truth, I do. I guess we humans are all alike; we like to be among our own. That urge has been getting stronger lately, and, in fact, I'm already forming plans to apply for permanent leave."

"This position pays, I imagine, quite highly?" Harrington knew as well as the other did just what it paid.

Soderstrom looked at him with guileless blue eyes. "Yes, very high paying position, but not out of reason to the amount of hazard and danger. The vacuum outside, you know, is like a ravenous beast, and now and then it takes its toll."

Harrington nodded. His expressionless face could not be taken as a gauge of the thoughts revolving in his mind. He turned to look squarely at the overseer.

"Mr. Soderstrom, if you were to get your permanent leave, who would take your place?"

Soderstrom hesitated only a moment, "Harvey Wood . . . . the missing mineralogist."

Harrington had not taken his eyes off the face of the overseer. "Mr. Soderstrom, I think it about time to get.

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*The ratio of gravity between earth and moon is more like 5 to 1, but due to the weight of the suit, Harrington carried not quite half the weight of his body on earth.

down to business. You know who I am, Richard Harrington of the S. I. S., sent here to investigate the disappearance of Harvey Wood, your foremost mineralogist. You, of course, will help me all you can."

Soderstrom's face had become slightly clouded as his visitor spoke of his mission, but he hastened to assure him that he would do all in his power to aid in the work.

"Tell me first the details of Harvey Wood's departure from here and any other significant data." Harrington's tone was very compelling.

"Well. . . . Wood left Station No. 7 five days ago. We regulate our days exactly as on earth, you know. His exploration trip was to be to the southeast in the direction of the Riphaean Mountains. Mineralogists are a very independent sort and come and go almost as they please, except they are responsible to me. As I say, he left five days ago. . . . and never came back. I sent out several men to see if they could locate his body, but, of course, here on the moon with its countless craters, valleys, ravines, and such, its a thousand-to-one shot, and they reported not hair nor hide of him."

● The agent thought a moment. "Did he speak to you of his plans before he left?"

"No, not that I can remember."

"Does he have any means of communication with Station No. 7 while he is out on duty?"

"Yes, he carried a radio in his suit, as they all do."

Harrington was very deliberate with his questioning. He would slowly and carefully ask the question and then search the other's face closely and disconcertingly, while he made his answer.

"Did he radio back at all after he left?"

Soderstrom felt sudden resentment toward this calm, cool man as he plied him with questions, but he smothered it as the reflection came that he was one of the S. I. S., and that meant no tomfoolery or stubbornness. Their word was a law unto itself.

He hesitated before he answered. "Yes. . . . that is, he told us he had made a find and. . . ."

"Did he say what kind of a find? Good or bad?" Harrington shot this at him before he had a chance to finish.

"Why . . . ah . . .ah . . . he said. . . . just another find. You know, the majority of claims are nothing out of the ordinary; we seldom hit those valuable claims that make this business a paying proposition to the U. S. R." The overseer finished up with an authoritative tone.

"I see," Harrington made the other drop his eyes with the intensity of his stare, and the overseer wondered what it was that he saw.

"And that was all the word you got from him?"

"Yes," answered the overseer, now somewhat on edge. He dropped his honest eyes again as those of the agent languidly fixed themselves on his face.

They sat for a full moment in silence, except for the noise of the typewriter in the other room. Harrington seemed to be on the verge of falling asleep, while the other found it hard to sit still and yet harder to break the strained silence.

"Ah. . . . Mr. Soderstrom." The overseer looked up with concern at the tone of voice to meet again those keen eyes. "Will you kindly get me a map of the Riphaean Mountains and surrounding region?"

With relief, the master of Station No. 7 rummaged in his drawer and pulled forth the required map. He spread it on his desk.

Harrington lazily arose and sauntered over to the desk and bent over the paper. "Show me, Mr. Soderstrom, just where you think Harvey Wood went five days ago."

With a fat finger the overseer traced a course from Station No. 7 across the Mare Nubium to a plateau region of the Riphaean Mountains.

"He went somewhere in this circle of about five square miles. Just where, of course, it would be impossible to say."

Richard carefully scrutinized the map. It showed not only the "seas" and mountains and other surface markings, but also the positions of nearby stations, both of the U. S. R. and the M. M.

"What is this. . . . 'Kranto'?"

"The Martians have always given their stations names whereas we of earth use only numbers. 'Kranto' is simply the name by which that Martian station is known in all official records."

Harrington stretched his thumb and forefinger first between Station No. 7 and the place of Wood's disappearance, and then between the latter and Kranto. Kranto was much nearer! Soderstrom wondered what was coming next.

Harrington wandered away from the desk, hands in his pocket, eye to the ceiling of rock. "Mr. Soderstrom. . . . ah. . . . could Harvey Wood in any way. . . . mind you . . . . in any way. . . . come in contact with the Ginzies . . . . pardon me. . . . Martians?" It was always considered impolite to use the term "Ginzie" except in familiar company.

"Well. . . . by mutual agreement between the two governments, there is supposed to be a standing invitation to either side to visit any of the other's stations in cases of emergency or necessity."

"Which means. . . ?"

"Which means that if a Martian finds his air supply low, too low for him to make it back to his own station, he has the perfect right to drop in on any nearby station, be it Martian or Tellurian, and replenish his supply. Or if he has any other pressing reason. . . ."

"Enough," the S. I. S. man cut him off. "Now, if your Harvey Wood had decided to drop in on Kranto for any reason at all, no doubt he would radio you first. . . . right?"

"Perfectly," Soderstrom eagerly continued. "But he said no such thing. As far as I know, he had no intention of going to Kranto."

There followed a period of silence while Harrington idly walked about the room and eyed the pictures with seeming interest. He turned to the overseer.

"Who takes the radio calls from your mineralogists?"

Soderstrom started up angrily. "Now, look here, Harrington, this is going too far . . . are you trying to implicate me in this unfortunate accident? The man died an unknown death out there in the vacuum. There's a dozen different hazards that make it a gamble to even walk around. About all you can do is go and look for the body yourself, instead of asking a lot of questions of me. I can't . . ."

Soderstrom suddenly stopped. Realization of the rank and authority of the man to whom he was laying down the law came as a bucket of cold water.

"Well . . . er . . . pardon me, Mr. Harrington, I'm

not trying to tell you what to do . . . I . . . ah . . . I'm just a bit nervous, you know, it's . . . it's this life on this dead, inhuman world . . ."

Harrington had not changed countenance during the outburst of the irate overseer, had merely stared at him mildly, and now nodded and turned away as if he had forgotten about it. Soderstrom looked at that broad back and wondered if he were a fool or . . . one who keenly wormed out information by cunning conversation.

Harrington turned a blank face to the overseer after yawning behind his hand. "I'm due for a long sleep, Mr. Soderstrom. I can't seem to think anymore. Been on the go for thirty-five hours since I left the home planet. This is a puzzling business, I must admit, and maybe by tomorrow I'll plan some course of action. This part of the moon is just beginning a fifteen-day long moonday, isn't it?"

"Yes, there will be about thirteen earthly days of sunlight in this latitude from today on."

Harrington looked at the clock on the wall. "I see it's eight o'clock in the evening and this is Monday . . . correct me if I'm wrong."

"No corrections necessary."

"Well . . . it's rather early to go to bed, but due to the lack of diversion, I guess that's the thing to do. Will you kindly conduct me to my sleeping quarters, Mr. Soderstrom?"

The methodical S. I. S. agent went right to bed, true to his word, and slept the sleep of the contented. He was satisfied; he foresaw a pleasant time of novel events in his present commission. He breathed a prayer of thanks to Wilson and the powers behind him, both material and super-material, for this balm to his adventurous soul.

CHAPTER III

Kranto

● The draft of cold air blowing across his face from the "awakener," one of the standard earth types, brought Harrington from dreamland to the problems of wakeful life. He called a lazy "come in" to the knock at the door as he finished shaving.

Soderstrom entered with a cheery morning salutation and a joyful smile on his guileless features.

"Hope you passed a restful night here in these poor quarters, however the best I can offer."

"Quite well, thank you," returned Harrington as he rubbed the talcum about his chin. "And you?"

"Very well, thank you." Soderstrom turned away petulantly as his guest closely studied his face. He wondered if the S. I. S. man could see the marks of an almost sleepless night.

"Mr. Soderstrom, could I presume on you to conduct me through Station No. 7? I feel I ought to see as much of it as I can; I may never have the opportunity again of being in one of the moon mines. It will be something to brag about back home."

The overseer offered his willing services and together they traversed the caves and corridors that composed Station No. 7. Harrington looked with wonder at the wells which were sunk to great depths to bring up the breathable air which had been imprisoned within the moon from long ages back. These pockets supplied the moderate needs of the small community of humans that labored in this rock-bound world. Then there were the versatile machines which performed the greater part of the mining operations; the ponderous ore-carriers; the rock-crushers; the rocket-driven drillers; the scoops and scrapers; and so on down the line. He marvelled at the amount of ingenious engineering expended in the task of extracting ores on the surface of an airless world. It was astonishing in its scope. The storerooms of the graded and assayed ores were full of their respective products. Every five days a large space ship carried the valuable minerals to earth to be there refined, accompanied by a powerful-armed warship; there were pirates to contend with and sometimes . . . hostile governments.

Overseer Soderstrom was greeted on all sides by the men at work. Harrington could see that his generally jovial character made him popular with those he was master of. Although the working hours were longer here on the moon, the work was easier by virtue of the lesser gravity. They passed through the industrial section and came to the living quarters. Here Harrington saw some of the women, wives of the miners and mechanics and chemists, busily (sometimes not so busily) bustling about their apartments in true earthly fashion.

He wondered how well these women stood the colorless unexciting life of cooped-up inactivity. He was not surprised to hear from the overseer that the average period of a workman's willingness to stay on the moon was something less than a year. There were new recruits constantly coming back with the emptied ore-ship to replace those who had resigned and returned to earth. The U. S. R. was very sympathetic with these people and it was considered no breach of socialistic doctrine at all to ask for permanent leave.

Harrington, satisfied with what he had seen of the inner workings of a typical mine of the moon, made known his desire to return to the main office to the overseer.

After seating themselves, Richard quietly spoke.

"By the way, Mr. Soderstrom, you haven't answered a question of mine I asked yesterday."

The overseer flushed. "Didn't I? I can't recall . . ."

The other was relentless. "Who takes your radio calls from mineralogists?"

"Ordinarily my secretary does that, he's in the other room."

"Did he or you take the call from Harvey Wood?"

"Well . . . I did." Soderstrom looked up carelessly.

"I see," came from the S. I. S. agent as he watched the overseer. "Mr. Soderstrom, we S. I. S. men work a lot by hunches. I am going over to Kranto after dinner. How long does it take to walk there?"

Soderstrom had started slightly as Harrington announced his intentions. His voice had studied indifference as he answered.

"It takes about five hours of steady walking. But may I make a suggestion?" At the other's nod he continued, "No doubt you are acquainted with the . . . what shall I call it? . . . frigidity of the Martians to an earthman. Well, here on the moon, it is intensified to a greater degree by the rivalry in our aims, so it may be a useless and embarrassing visit."

"This," Harrington pointed to the invisible seven-pointed star on his forearm, "is all the security I want that I shall be favorably welcomed, if not in spirit, at least in actions."

Soderstrom shrugged his shoulders. "I will have your

oxygen tanks examined and filled and you can start anytime you please."

"Thank you. Expect me back within twelve hours." Harrington walked out of the office. Once the door was closed, he put his ear up against it and strained to hear what was going on inside. After a stretch of silence, when he was about to leave, he heard the overseer arise, and walk to some other part of the room. He seemed to hear a noise as of a hinged lid being raised, and then Soderstrom's voice, muffled and wholly unintelligible. Harrington walked away with a slight smile on his lips.

● Six hours later he saw before him the portal of Kranto, the Martian station nearest the spot where Harvey Wood was last known to be. The five-hour walk in the uncomfortable, hampering suit had about consumed the patience of the earthman, and he longed to take it off. The endless vista of towering cliffs, sharply relieved by the stationary sun with shadow and blinding sunlight, had somewhat taken the zest out of the walk. It compared so unfavorably with the warm, softened scenery of beloved earth, or even of more barren Mars, or even of humid Venus. Richard wondered how the moon-miners could even stand a year's worth of this blighting, harsh world, where not even a flower broke the monotony of rock and sand. The gibbous earth shone brightly in the black sky, her topography easily visible, even at this great distance.

"Good old earth," muttered Harrington, the same Harrington who had longed, not two days before, to leave her for a place of boredom and idleness. "But before I go back to you, I've got to solve the mystery of the Moon Mines, which has turned out to be a bigger thing than I realized from what Wilson told me. Soderstrom? . . . well . . . time will tell about him. The immediate thing is 'where is Harvey Wood?' "

The outside seal of the Martian station, unlike that of No. 7, swung open outwardly in two halves. The routine of getting to the aired room was essentially the same as at No. 7, except that the signs were all in Martian, which bothered Richard not in the least.

"Now for the damned Ginzies," he muttered as, his suit off, he pressed the attention button.

"Sun shine upon you," iterated the bony Martian who answered the bell.

"Fortune favor you," answered Harrington. "I come to see your overseer, Sul Minto Pruma."

The Martian looked suspiciously at him for a moment and then said, "Follow me."

In the overseer's office, Harrington was confronted by the master of Kranto. Sul Minto Pruma was a typical north country Martian; eight feet tall, bony, spindle-legged, fur-faced. His deep set eyes stared out at the visitor with the usual Martian haughtiness. In a glance the earthman knew that he was of the lower class of that world of cold, austere people. Judging that he probably knew little or nothing of Tellurian speech, Harrington opened the conversation in Martian, the gutturals and sticking consonants of which he had mastered to a degree of excellency little below that of a native of Mars.

"Sun shine upon you, Kruno Pruma. I am Richard Harrington of the U. S. F."

"Fortune favor you, Kruno Harrington." The formality of greeting over, the Martian changed his tone. "And what, may I ask, brings you here?"

Incensed at the unwelcome tone, Harrington said "cursed boorish Ginzie" under his breath, the while he answered, "I come in behalf of the U. S. R. to . . ."

"By what authority?" burst in the Martian with obvious scorn.

Harrington calmly pulled up his sleeve, breathed upon his arm, and held it out that the other might see the S. I. S. emblem.

Pruma grunted and offered his visitor a seat. An S. I. S. man was not to be trifled with, even the most proud Martians knew that.

"And now, Kruno Harrington . . .?"

"Kruno Pruma, I merely come to ask you a few questions which I am authorized to ask by virtue of the seven-pointed star." The Martian nodded slightly. "Kranto, this station, is very near the Riphaean Mountains. In the foothills of these mountains was sent an earthman to look for claimable territory. His name is Harvey Wood. He was last heard of there. Due to the nearness of Kranto, I have entertained the idea that he may have dropped in upon you. That was five earth days ago. Did you see this man?" Harrington's tone was mild and polite.

"Of course not!" exploded the Martian.

"If he did apply for entrance, this fact would come to your ears, no doubt?"

"Certainly. But I have told you once, he did not come."

"You will swear to that?"

"I will swear to nothing." Pruma arose in anger. "My word is all the security that you should need, and don't persist in throwing implications at me or . . ."

"Or what, Kruno Pruma?" Richard's voice was suave and low, like a flute compared to the hoarse bellow of the enraged Martian.

The overseer spluttered, bethought himself of the rank of the earthman before him, and took his seat begrudgingly.

"You have heard my answer. Do with it what you will."

"All right. I take your word for it as the integral word of a Martian, for, of course, no Martian would think of lying to an S. I. S. man who are of that breed that ferret out truth to the detriment of any teller of false tales." The Martian squirmed under the sugared threat. "Now, Kruno Pruma, do your mineralogists very often meet those of our people when exploring the open reaches of the moon in search of claims?"

"No, and the less, the better."

● Harrington passed by the obvious defiance. "It has come to my notice that in the past five moon days, three claims of considerable importance were filed by *both* the U. S. R. and the M. M., those of the M. M. having the priority by some few hours."

"Well . . .?" The whole demeanor of Pruma bespoke defiance.

"Doesn't it seem odd in the face of your statement that mineralogists of our two worlds meet very seldomly, that they filed the same claims within hours of each other?"

"Why . . . you . . ." With an effort the Martian controlled his fiery temper. His voice held a world of hatred. "Kruno Harrington, you are insolent and suspicious and hardly worthy of any hospitality from me. I must ask that you forbear asking questions of that sort."

Harrington was stumped. His authority, though calling

for a lot of respect and attention, was incapable of forcing a citizen of the M. M. to answer personal questions. Then there was his chief's warning ringing in his ears, "if ever you used diplomacy before, be sure to handle it with gloves in this matter." He could easily see that Sul Minto Pruma was not easily intimidated by the badge that he wore on his arm, and that things could be brought to the pass of open enmity by injudicious policy.

"If I only had something on him, some little thing, I could get past his guard," Harrington thought to himself. "As it is . . ."

"I beg your humble pardon, Kruno Pruma," he said aloud, "no doubt there is just the laws of coincidence to explain the filing of those disputed applications. In any case, that is said and done. I come primarily to find some trace of Harvey Wood. As long as you have assured me he has not been here, it must be that he died out in the vacuum."

"A very logical conclusion," agreed the Martian, somewhat mollified by the retreat of the earthman. "I lose certain of my men every moon day, and I go not to Kruno Soderstrom and ask him 'did so and so come here, on your word of honor?' "

Harrington, calm of face, inwardly raged at the choice sarcasm in the "damned Ginzie's" voice and words.

"Yes, this is a dangerous game you are playing," Harrington returned. As Pruma looked at him, anger clouding his face again, he continued, "Moon mining is about the most dangerous game of life, not so, Kruno Pruma?"

The Martian calmed himself although suspicion was written all over his face. "You are right, earthman, if it weren't for the big pay, it wouldn't be worth the risk."

"May I, as a matter of personal interest, look about your place?" Harrington's voice was as guileless as that of a child.

Pruma seemed to hover between uncertainty and suspicion. It being a personal request, he could refuse without violating the respect due to an S. I. S. agent on matters of business. But something decided the Martian to grant the whim of the earthman; perhaps it was in atonement for his ill-graced welcoming; but Richard could not for one minute acknowledge that. "Ginzie" and "trickery" were one and the same words to him.

"Yes . . . I'll have one of my men conduct you around."

An hour later, Harrington stepped into Overseer Pruma's office to say goodbye, thanked him for his courtesy, and went to the air lock. He hastily looked around the room, saw that no one was in it, and took his suit from its hook. Minutely he examined the fabric, inch by inch. Then he looked over the helmet. When he came to the oxygen tanks in back, he stopped short and whistled softly.

Just as he had suspected, the unit for breathing had been tampered with. One of the slender metal tubes which carried the precious oxygen to the helmet bore the marks of a pliers. It was hardly noticeable except at close range. The tube had been bent slightly out and then bent back again to its original position so that it was apparently untouched. But Harrington knew that even that slight bending had weakened the metal enough so that the terrific cold of the outside would snap it and end the wearer's life in an instant. Then Pruma was afraid of him! There must be something he feared would be disclosed by the S. I. S. agent! Harrington exulted momentarily. He had something to go by!

But the needs of the moment chased all other thought from his mind. Looking up and down the rack of suits, he was surprised . . . very pleasantly . . . to see another suit of Tellurian make and size hanging there. Hastily he plucked it down, gave it a quick examination, and grinned satisfied. From his old suit he carefully unscrewed the damaged oxygen line from the helmet and the tank, and deposited it in a pocket of his uniform. Precious burden to him! In a few more minutes he had walked out of Kranto and headed for Station No. 7.

As he walked rapidly along the sands of the Mare which stretched between the stations, he wondered how it came that an earthman's suit hung in Kranto. He caught his breath as he thought of one possibility. It could be Harvey Wood's! Lucky thing for him to have found it because it saved him the necessity of walking back to Station No. 7 in a Martian suit, much too big, and distasteful to the delicacy of Harrington's regard for things Martian. He would have considered that a taint long to blot his conscience, for with his numerous contacts with the Martians, he had never found anything he liked about them. They were a tribe of "damned Ginzies" to him, from the highest down to the lowest, except for an occasional south country Martian who actually partook of some humanity in Richard's critical mind.

CHAPTER IV
A Second Visit

● It was in the early hours of morning as reckoned by earth time, although on the moon the sun had hardly moved since Harrington had arrived, that the lone wanderer entered the air locks of Station No. 7 and betook himself straight to bed. He sauntered into Soderstrom's office sometime before the noon meal.

After the morning greetings, the overseer opened the conversation.

"I hope that in spite of my prejudices to the contrary, you had a pleasant visit at Kranto?"

"Quite pleasant," assured the S. I. S. agent and his voice betrayed to Soderstrom not the slightest hint of prevarication.

"Did you . . . find out anything?"

"Nothing much. Apparently Harvey Wood never entered Kranto. His body, I suppose, lies somewhere out in the vacuum."

Soderstrom nodded eagerly. "I was convinced of that from the first." He turned to the papers on his desk. "If you will pardon me for a while, Mr. Harrington, I have some imperative matters to attend to at present. You will have dinner with me?"

Harrington nodded aquiescence, thanked the overseer and left. It lacked yet two hours of noon, and he decided to pay his space ship a visit. He found it intact, air gauges registering, internal heat at the minimum it was maintained when unoccupied. Inside he took off the suit, rummaged around in his private belongings for some minutes, and again stepped out into the vacuum. He paused a moment to look fondly at his trim little cleaver of the ether. *Bertha* stood out in black lettering on either side. "Little Bertha" he affectionately called her, and indeed sometimes he drove her at lightning speed through space, when it pleased him to compare her to a cannon-

ball, although no cannonball had ever gone as fast as the ship.

He arrived back just in time for the noon meal, when everyone in Station No. 7 and, in fact, on the moon (excepting, of course, the Martians, who had different periods) was his own master for two hours.

The overseer and his guest had dinner in the former's private quarters. In three years' time, Soderstrom had managed to equip his rooms with those things which make earthly habitations dear to a human. He displayed a good deal of artistic taste in the variety and placement of the pictures, figurines, statuettes, and artificial flowers. The S. I. S. man gazed approvingly around and complimented the other on his cozy suite.

"One could easily forget he is on the moon in these rooms, Mr. Soderstrom."

The jovial face of the overseer broke into a genuine smile of pleasure. "Thank you . . . immensely . . . Mr. Harrington. I have tried to make my stay here as pleasant as I could so that I could be in the peaceful frame of mind necessary to good work, as the rulebook of the socialistic doctrine of lifework prescribes as essential."

Harrington's lips curled slightly at the reference to the rules of socialism. His natural love of freedom often prompted him to hold the strict bonds of socialism in slight contempt. His advanced thought, on the other hand, curbed this impatience at a government so exacting for he realized that it was far better than the old capitalistic system of cut-throat competition in a world of so many beings. Harrington had stored away in his active brain his idea of a perfect world, as near as it was possible to attain, as far above socialism as that system was above capitalism. Many and many a time he sighed as he realized that he would never live to see or find such a world where its citizens were as free as the air they breathed.

Harrington ate heartily of the well-laden table of foods, limited in variety, but unlimited in quantity. He was surprised to see fresh vegetables before him. Soderstrom proudly explained that they had the most perfect refrigerators right there on the moon. "We simply store the fresh vegetables and meats in a chamber connected to the outside vacuum and they are preserved indefinitely!" Richard nodded admiringly.

Their appetites appeased, the two men lounged on the luxurious divan and smoked the harmless cigars of that period, free from all injurious ingredients.

"Mr. Soderstrom, how many men are here in Station No. 7?"

"Of the men alone there are 146 at present, not counting you and Harvey Wood. Then there are 58 women." Soderstrom, in trivial conversation, was a perfect host; his voice was unaffectedly friendly and melodious.

"How many men go out in the vacuum each day to the different mines in those big sealed mobiles?"

"There is a force of about 50 men that spends all its time right here in Station No. 7. They are the assayers, ore-sorters, cooks, repair men, etc. The rest are the true miners and labor out in the vacuum."

Harrington seemed puzzled about something. "Would you mind describing in full the process of mining on the moon, from filing the application to shipping the ore?"

"Glad to," smiled the genial overseer, relieved that the S. I. S. man was in a mood for conversation not pertaining to his commission. "First of all, a mineralogist scouts around quite haphazardly till he comes upon what to his experienced eye is likely-looking terrain, or rather, lurrain. He picks up, or chops up, samples, takes a careful measurement of the latitude and longitude by the sun or by the stars if it is night, and returns to his station. The samples are turned over to the assayer, who reports the assay to me.

"If the ore proves rich enough in metal of value, the official application is sent to the Moon Mines Council. When this comes back with the Council's seal, work is begun on the claim. Machinery is sent over there in due time, set up, and digging started.

"Once the set up is complete, two men can handle the work. At present Station No. 7 is working 45 claims within a radius of 200 miles. Station No. 26, on the other side of the moon just about, which, by the way, is no different than this side," Harrington smiled, "operates 122 claims, an all time record. The metal most exploited is platinum, with rhodium a close second."

● "Do you know that a short hundred or so years ago platinum was more valuable than gold?"

Harrington arched his eyebrows in surprise. Platinum, which was hardly as valuable as tin, pound for pound, was at one time more valuable than gold? How commodities changed!

"Several of the stations also have claims containing that wonderful beryllium." The latter metal at that time was just coming into its own as the most useful of all the metals. "The ores are brought to the station, then, and here the force of graders sort out the various types and kinds, label them, and pack them for shipment."

"Simple enough except that the vacuum outside asserts its independence once in a while and takes away a life, eh, Mr. Soderstrom?" Harrington was watching his face.

"Yes . . . that is an ever present danger. Despite our constant inspection of suits to see that they are in perfect condition, every once in a while a man is reported missing. Sometimes we find the body, frozen, puffed out, blotched with lumped blood; usually we don't." Soderstrom shuddered slightly in remembrance of such sights. "Once, four years ago, when I was assayer at Station No. 14, a ground mobile was found with seven dead men in it. A meteorite had pierced it."

The listener shook his head in sympathy. He ruminated for awhile.

"Where do the returning ore-carriers and those going out enter this station? As I come to think of it, I haven't yet seen any in motion."

"There is another lock to our left from here, the back door, it may be called, which is much larger than the one you came through. It easily accommodates the wide ground mobiles. A force of men working a claim usually stays out two weeks; they are fully stocked for longer than that period of time with oxygen and food and water. Our water, incidently, comes from earth, there being none in this dried up rock called the moon. The men out mining constantly work in suits except at mealtimes and rest periods, when they enter the big mobiles, which are miniature apartment houses."

"Your machinery is all rocket-driven, isn't it?"

"Yes. Water power, wind power, steam power, gasoline power are things unknown, in fact, impossible on the moon."

"Have you heard of the new invention deriving its

energy from the heat rays of the sun, transforming them directly to electrical energy?"

"Rumors of it have reached me here," nodded the overseer eagerly. "Such a contrivance would be ideally suited to the moon where the rays of the sun beat down with undiminished intensity, as does not obtain on earth. I hope the day comes they will perfect the invention."

"Speaking of sun rays and such, what protection have you miners from the harmful cosmic rays which must be constantly deluging you here on the airless moon? You know, we space rovers take our 'cosmo-pills' regularly as soon as we leave earth to build up resistance to the rays."

"Why . . . we go you one better here, Mr. Harrington," chuckled the overseer. "Our food is always impregnated with the 'cosmo-powder' so that we need have no fear on that score."

Harrington nodded his head approvingly. Trust the intelligence of the Bureau of Mining back on earth to think of everything. The unfaltering accuracy of the government of socialistic Telluria, however distasteful its mastership was to Harrington, always elicited his earnest admiration. A glance at the clock brought him to his feet.

"Well, Mr. Soderstrom, duty intrudes in our little chat. I am going over to Harvey Wood's burial ground, if it is that, and look around there. I can't report back to my chief unless I can honestly say I am certain how he died . . . and where he died."

"As you choose," agreed the overseer resignedly, "But please be careful, as much for my sake as for your own, if you climb any hills or mountains. The slightest mark or dent may ultimately let the vacuum in. I don't want the whole S. I. S. here inquiring why a certain Richard Harrington died on the moon, as I've heard happens when one of your number meets an untimely death." He looked seriously at the other as he spoke. "That absolute cold and vacuum is like a crouching lion and his equally vicious mate, watching an unwary victim."

Harrington hastened to assure that he would use all precaution, reminding Soderstrom that it was never the policy or failing of the S. I. S. to be careless or rash.

In fifteen minutes Harrington stepped outside the last seal into the blazing sunlight. Hardly had the door closed when he extracted a small round box from his outer pocket with his gauntleted hand and held it up to his helmet as he walked back and forth at right angles to the path between Station No. 7 and Kranto. The needle was motionless. Harrington stuck it back into his pocket. Soderstrom was not connected with Sul Minto Pruma by low-wave radio, at least not at present. Richard hastened to the "burial ground of Harvey Wood," as he had told Soderstrom. But he didn't head in the direction of the Riphaean Mountains; he headed straight for Kranto.

A second time he entered the office of the Martian overseer. He was out at the moment and the attendant gruffly asked him to sit down and wait. Harrington complied, but as the door closed behind the Martian, he sprang up, jumped over to the desk, and hastily opened drawer after drawer, peering hurriedly at the contents of each. With a smothered cry of triumph, he pulled a pliers out of the last drawer, placed them in his coat pocket and sat down. He loosened his gun in its holster, while he kept an eye on the door, and then assumed an indolent pose.

When Pruma entered, he saw a languid earthman with a peaceful look on his face lolling in the chair.

"Sun shine upon you, Kruno Pruma," spoke the visitor as the Martian haughtily stood before him.

"Fortune favor you." He glowered at his guest. "You are back again. What suspicion brings you this time?"

"Your kind welcome to my previous visit whetted my appetite for more of Martian hospitality," answered Harrington bitingly.

"Bah!" Pruma turned his back and seated himself at his desk. "You are pleased to be humorous . . . but your humor is as out of place as you are, Kruno Harrington."

"Kruno Pruma," Harrington's voice had lost its silky touch. It sparkled with flint and determination. "Harvey Wood is within Kranto, alive or dead! I have come to rescue him if alive, avenge him if dead!"

The Martian half arose in furious anger . . . and then sank back in his seat with jaw agape as he saw what Harrington held up in his hand. He saw a slender metal tube and a pair of pliers.

"You recognize these pliers. They are yours. You ought to recognize this tube, you bent it with the pliers. See . . .?" Harrington showed how the jaws of the pliers fitted into the corrugations on the tube. He turned a stern face on the Martian. "Pruma, you have made a mistake. You didn't expect to see me alive. You have attempted the life of an agent of the S. I. S. *Do you realize what that means?*"

The Martian's jaws worked spasmodically. "My government will uphold me . . . they'll believe me when I say you framed me with this tube and pliers you stole . . . they'll laugh at you . . ."

"Pruma," Harrington cut in on the ravings of the overseer, "The word of an S. I. S. agent is always accepted as truth, as well by the M. M. as the U. S. R. You stand accused of attempted murder . . . perhaps of actual murder . . . if Harvey Wood is dead."

"No . . . no!" This had been wrung out of the Martian involuntarily. "That is . . . I don't know anything about your man Harvey Wood."

"You lie, Pruma; Harvey Wood is alive here in Kranto. Listen to me, I will bargain with you. If you will lead me to that man and if he is alive, I will turn over to you this tube and pliers. What I shall learn from Wood may get you in trouble, but at least you won't have the accusation of attempted murder of an S. I. S. man against you."

The Martian overseer had again gained control of himself. He thought the proposition over the while Harrington toyed with the tube and pliers. He was in trouble already. His government would stand for many shady things, but . . . this was an S. I. S. man. That unbalanced the scale.

"Agreed, Kruno Harrington." He stretched out an eager hand for the evidence of his crime.

"No, no, Kruno Pruma, first you lead me to Harvey Wood."

With an almost inaudible grunt, the Martian stepped to the door, Harrington close behind. They walked through corridors and passageways till Harrington had his sense of direction completely disturbed. He looked with suspicion at the Martian. Was he leading him purposely in circles? He rested one hand on the butt of his pistol.

Finally Pruma stopped at a door, spoke softly the combination into the voice-operated lock, and stepped in as Harrington motioned that he should precede. A man

seated on a couch in an attitude of dejection, looked up. His face changed from disinterest to joy as he saw an earthman with the Martian.

Pruma turned to his enemy. "There is your Harvey Wood. Give me my property that I have bought at this price." Harrington handed over the two implements, thought better of it and pulled back his hand. But the overseer caught at the tube, snatched it away, and . . . Harrington found himself looking down the barrel of a pistol. The pliers had dropped to the floor.

As they stood thus for a moment, strained, on guard, the Martian slowly backed to the door, his pistol pointed straight for Harrington's head. With a sardonic grin, he spoke. "Pick up that pliers, Harrington, and throw them at my feet. Then throw your gun at my feet also."

With a shrug of resignation, Harrington complied. The overseer carefully stooped, picked up the objects the while he kept his wary eyes on the earthman, and then spoke rapidly with his head near the lock of the door. Harrington could not catch the combination. As the door swung open in obedience to the voice of the Martian, he backed out. "So now, Kruno Harrington, you will taste to the full my hospitality."

As the door automaticaly slid back in its groove, Harrington shouted enraged, "You are fooling with atomic power when you tamper with the S. I. S."

CHAPTER V

The Snare

● "S. I. S.?" echoed Harvey Wood who had silently witnessed the whole drama. "Are you one of them?"

"Yes . . . Richard Harrington of the Service. You are Harvey Wood of Station No. 7?"

The other nodded. "What's this all about?"

Harrington looked all about the room before he answered. "It looks as if we're two birds in a gilded cage." He turned to the mineralogist. "How long have you been here?"

"All eternity, it seems. Actually seven days."

"Then you came here to Kranto after you spotted a claim in the Riphaean Mountains?"

"Yes," Wood nodded eagerly, "I'll tell you why I'm here. That claim I discovered is the best find in years. Pruma is an unscrupulous, grasping, damned Ginzie, and Soderstrom is . . ." Wood stopped and looked at his companion.

"Go on, you are speaking to an S. I. S. agent. I can demand your statement."

"Well . . . I'm convinced Soderstrom is in with Pruma. It's a combine. Soderstrom gives away the claims, gets a handsome price, and Pruma gets the high commission that the M. M. gives its overseers for new claims."

"What proof have you of what you say?"

"Proof? . . . plenty. I made the last of three claims that were stolen by the Martians . . . not stolen either, given away . . . I should say. There was not a Martian around in all the time I picked up samples of ore and yet, when the application was sent in, the Council informed us there was a Martian claim ahead of ours by three hours!" Harvey Wood was storming mad. "And this last claim . . . I picked up samples in which I could see the metals sticking out . . . it was magnificent! Then I saw my air supply was low; I have an idea . . . I knew I could never make Station No. 7, so I hurried here to Kranto. My oxygen just gave out as I got in the last seal. I pressed the button . . . you know, the one that brings the attendant . . . and then fainted from lack of air; I hadn't strength enough to unscrew my helmet. I woke up in this room. I know just what happened. Pruma was called when I was discovered. He took one of my samples, assayed it, saw it was the thing, probably called Soderstrom to find out who I was and then carried me unconscious to this blasted prison."

Harvey Wood was a tall, frank-featured man with a nervous temperament. He spoke fluently and logically. He turned to his companion. "Beg pardon, Mr. Harrington, for my uncouth way of welcoming you."

"Quite all right, Mr. Wood. My business here on the moon is vitally bound up in anything you can say. The U. S. R. wants to know why Station No. 7 is afflicted with claim-jumping, and I'm here to find out."

"I'm certainly glad to hear they finally got the S. I. S. on the trail. Any help I can give you, Mr. Harrington, is yours for the asking, although it looks as if right now we're helpless." Wood waved a lax hand about the small prison.

"No worry about that," exclaimed Harrington. "There are a few points I want cleared up. First of all, how are claim applications filed at the station?"

"The mineralogist brings in his samples, turns them over to the assayer, and either writes the location down on a piece of paper to give to Soderstrom, or enters it in the books himself, depending on how busy the overseer is at the time."

"Who entered your last claim in the books?"

"Soderstrom."

"All you did was write the location down on paper?"

"Yes, I wrote it down and immediately left. Soderstrom, cheat and traitor that he is for all of his geniality, simply radioed the location to Pruma and then entered our application several hours later. That's the way I have it figured out."

"What makes you so positive that Soderstrom is guilty?"

"The laws of chance might explain one claim being found by two different people within hours of each other, but they can't explain three of them within such a short period of time."

"Outside of that you have no absolute proof of his implication?"

"Well . . . no, to tell the truth."

"That alone is insufficient. Laws of chance won't stand in court. We've got to get a confession out of Soderstrom. But we're going at this thing wrong end to. First of all we've got to win our liberty. Mr. Wood, what do you think is the next step that Pruma will take?" Harrington had ideas of his own but be recognized in Wood a keen mind. His ideas might be gold mines, just as his life work was discovering them, or similar mines.

"Here's my opinion about the whole thing, Mr. Harrington. Pruma is a heartless fiend of a Martian, and it would suit his purposes to give me to the vacuum, but I imagine Soderstrom had acted as a check to his high-handed ideas. The latter probably shows Pruma a more diplomatic way every time he wants to jump in over his head. The second day I was here, I got a visit from my overseer."

Harrington betrayed no emotion, but this statement started a new train of thought. "He seemed sorry that I was confined and assured me that he would smooth over

Pruma's fit of what he called 'distemper' at my exploring so near to Kranto. Then he became confidential. He said, 'Harvey, you give me the location of your new claim. I'll scoot back to the station and file our application. In the meantime I'll work for your release. I'll threaten Pruma with the wrath of the U. S. R. and he'll let you go, never fear.'

"Well, Mr. Harrington, I saw through that little plot like you see through your helmet visor. No sooner would Soderstrom get the location, he would give it to Pruma, get my release, and then file our claim, but . . . hours after Pruma had his in.

"I became stubborn. I told Soderstrom I would enter that claim myself when I got back to Station No. 7, and that neither he nor anyone else would hear about it before that was done. Then he changed. He became angry. 'Trying to tell your own overseer what to do? Man, I'm your master. I command you give to me that location!' I laughed right in his face. 'Go and command a flower to grow right out on the sands of the Mare Nubium,' I said. He saw it was useless and he left.

"They both know I'm dangerous; that I suspect too much; and the only reason I can figure out for my being alive and kicking today is that I have locked in my mind the location of the best find of many years. If you ask me, I think Pruma has sent out half his mineralogists to the Riphaean Mountains to try to spot that little claim. Failing in that, as he will, he will try to work it out of me; but now you're in the picture, I haven't quite figured out what he will do next."

Harrington was ruminative for a while. Much that Wood had told him dove-tailed into his own speculations. Suspicions were turning to assurances.

"Mr. Wood, I think I know what they will do next." He hesitated a moment before he spoke. Then his voice was cold and chilling. "Pruma is going to give us both to the vacuum. He knows I'm on to his game; Soderstrom is undecided as to how much I suspect; they both know that you are dangerous . . . so they are going to . . ."

"Yes, I know . . . going to put both of us out into the vacuum with a low supply of oxygen, or a split seam in our suits, and claim accidental death. They will plead and magnify the dangers of life on the moon to a government of ruthlessness on one hand . . ."

"And a government with hands tied behind its back, on the other hand," finished up the S. I. S. man vehemently. He saw now why Wilson had been so indefinite . . . so discouraging. This Moon Mine affair was a bottomless pit of intrigue of the M. M. Harrington was not pitted against Pruma alone and his dupe; he had to face the might and ruthlessness of the M. M. itself.

"Damned Ginzies!" murmured the man whose arm bore a blue star.

There was silence for a while, then "There is one thing I have left unsaid," Harrington spoke almost to himself, while Wood raised his head and peered at his calm face. "We men of the S. I. S. have a motto . . . 'Right makes Might.' It is adopted from an ancient proverb of pre-interplanetary times. Wood, you heard what I said to Pruma when he left . . . 'You are fooling with atomic power when you tamper with the S. I. S.' Maybe even his aborigine mind will absorb the fact that the loss of one man of the Service means the start of a relentless, irresistible investigation by his fellows . . . and I defy the M. M. to stop them once that happens."

Harvey Wood had heard of the S. I. S. . . . as who hadn't? . . . but knew little of their spirit. He digested this statement of his companion and shook his head as he thought of the consequences of this affair of claim-jumping to those guilty of the crime.

Harrington looked at the Martian overseer blankly as he returned an hour later after the imprisonment. With a bow Pruma handed Harrington his pistol, and Wood a leathern knapsack, his samples of the new claim.

"Kruno Harrington, I must beg your humble pardon for thus putting you to some restraint, but you see, I felt that you should realize that I resented the accusations you cast . . . and your manner of investigating. Accept this as the foolish action of an easily-angered Martian. I have nothing against you . . . and nothing to fear from you. As for this man Harvey Wood, he may have certain prejudices, but I am sure upon careful investigation, they will turn out to be incorrect. You are free to go . . . with my regards."

Harrington could see the ill-grace of the Martian in his very manner and voice. He was playing a part. This called for caution. He should be called for his high-handed actions, for attempted murder, for unlawful imprisonment . . . but then . . . Wilson had said to use diplomacy.

"I am glad to see you have chosen the best course, Kruno Pruma. You have won my good will. But . . . the S. I. S. always demands retribution for wrongs . . . life on the moon is dangerous . . . especially for . . . you, Sul Minto Pruma!"

Both Pruma and Harrington had pistols in their belts. The Martian had his back to the closed door, his eyes took in the lithe, easy grace of the earthman. Pruma was no fool; he knew Harrington was thrice as fast as he was; could draw that gun in the wink of an eye; could even leap at him should he try to draw his gun. Harrington had threatened him; could he carry out the threat?

The Martian's eyes shifted to the other earthman, then back to the S. I. S. agent. Deliberately he turned his back and voiced the combination.

"Come, Wood, let's get back to Station No. 7," said Harrington tersely as he followed the Martian closely through the door.

At the door of the first air lock, Pruma bowed low as he stood beside the entrance.

"Kruno Harrington is a wise man. He will find out that Pruma, although hasty at times, is incapable of doing anything to merit the wrath of the S. I. S."

Harrington, with seeming indifference, watched the tall form of the Martian overseer disappear around the corner of the corridor.

Once in the first air lock chamber, Harrington pulled down two of the Martian suits. "Can't take a chance on these suits," he said as he pointed to the two suits of earth make hanging by the door.

Two distorted and queer figures traversed the distance between Kranto and Station No. 7, their sharply outlined shadows trailing behind them. With a sigh of relief, they took off the misfitted suits in the air lock of the latter station. Harrington placed a restraining hand on Wood's arm as he was about to step forward toward the door.

"We were mistaken, Wood, about Pruma's intentions. He didn't tamper with those suits of ours. If he had, he

would have removed all the Martian suits, so that we'd be forced to take the two meant for us. He's decided to outwit us, he and Soderstrom. They think I'm stumped for lack of evidence. Well . . . I am."

Wood looked surprised. "Soderstrom can't explain away all these things to my satisfaction, Harrington."

"Of course he can't to you or to me; but to a court he can. You see, there must be either absolute evidence against the man, or there must be a confession. We haven't got the former . . . " The S. I. S. man paused and then resumed. "Wood, are the duties of an overseer complicated? Do they take special training or ability?"

"Nothing of the sort, Mr. Harrington. It's just a matter of being invested with authority to run the station. Why, I could step right into his boots today and carry on the work."

"That's just what I wanted to know," Harrington exclaimed. He drew closer to the mineralogist. "Listen carefully to me. We are going to get a confession out of Soderstrom. Don't ask me how; I'll attend to that. Then because I don't believe he is really criminally-minded, but just a dupe of the overseer of Kranto, I'm going to offer him his written confession to destroy, after he has written out an official resignation. In other words, he will leave the moon honorably, even though he has proved a traitor; but . . . you will be in his place.

"You see, my chief back on earth told me that I was to rectify the matter of claim-jumping, but with diplomacy, because of the strained relationship between the two worlds. So in this way I will accomplish my purpose. I will be getting the source of the trouble out of the position in which he has sold claims, and I will be filling his place with a man I know can be trusted."

"Thank you for your unmerited praise, but are you sure I will be chosen to take his place?" Wood looked dubious about it.

"Yes, you will . . . Mr. Wood, because when I get back to earth, I'm going to recommend you and without boasting, I can say that the recommendation of one of the S. I. S. carries weight in the Bureau of Employment."

The eyes of Harvey Wood sparkled. To be head of Station No. 7 was all he could hope and wish for to satisfy him until such time as he should tire of life on the moon.

In a low voice Harrington then explained carefully how they were going to present themselves to the overseer, and what part each was to play. Wood nodded understandingly as he finished.

CHAPTER VI

Trickery

● Overseer Soderstrom jumped up and warmly shook hands with both of the men. "Why . . . Harrington . . . you amaze me . . . so you actually found Mr. Wood . . . this is indeed a surprise. Where was he? How did it all come about?"

Harrington looked full at the genial overseer as he answered.

"I can't claim much credit myself. I turned to good account some damning evidence I had that Overseer Pruma was bent on ending my career, bargained for information about Wood, and got it. Then with Pruma's pardons for his actions ringing in my ears, we left Kranto. Mr. Wood, here, seemed to have a few suspicions that you were connected with his retention at Kranto, but I convinced him that you are above reproach, Mr. Soderstrom."

Soderstrom's face had momentarily changed color at the suspicions of Harvey Wood, but again cleared on hearing that Harrington had himself cleared his name of implication.

"And now I think Mr. Wood had better file application for the best find of many a year." Harrington nodded to the mineralogist as he spoke. It was done in a few moments.

It was still early morning, so Harrington and Wood betook themselves to welcome beds. Soderstrom paced up and down in his office, frowns and looks of fear chasing each other across his face.

The three of them had dinner together. The talk revolved about topics of mother earth; and the beings who trod her surface. Soderstrom again expressed a desire to resign his position as overseer and go back. Wood and Harrington exchanged guarded looks of grim mirth. The mineralogist described to Soderstrom the appearance of the ore samples of the new claim and intimated that it would probably prove to be one of the richest claims of all times. He had turned over the samples that Pruma had returned to him before they left Kranto to the assaying department and hoped to have a report sometime that afternoon. Harrington confided that now that Harvey Wood was safe and sound, and his mission over, he would leave the moon the next day after a good rest.

Dinner over, Soderstrom excused himself, pleading pressing work, leaving the other two alone. After a short conversation, they decided to have the show down an hour later in Soderstrom's office.

Harrington entered first by agreement. Soderstrom looked up in surprise. "Have a seat, Mr. Harrington, is there anything I can do for you?"

Harrington idly seated himself, straightened his coat, and then turned unblinking eyes upon the overseer.

"Mr. Soderstrom, I have a confession to make. The S. I. S. did not send me here to find Harvey Wood . . . alone . . . but also to investigate the Martian priority in claim application, a triple occurrence within the last five moon-days."

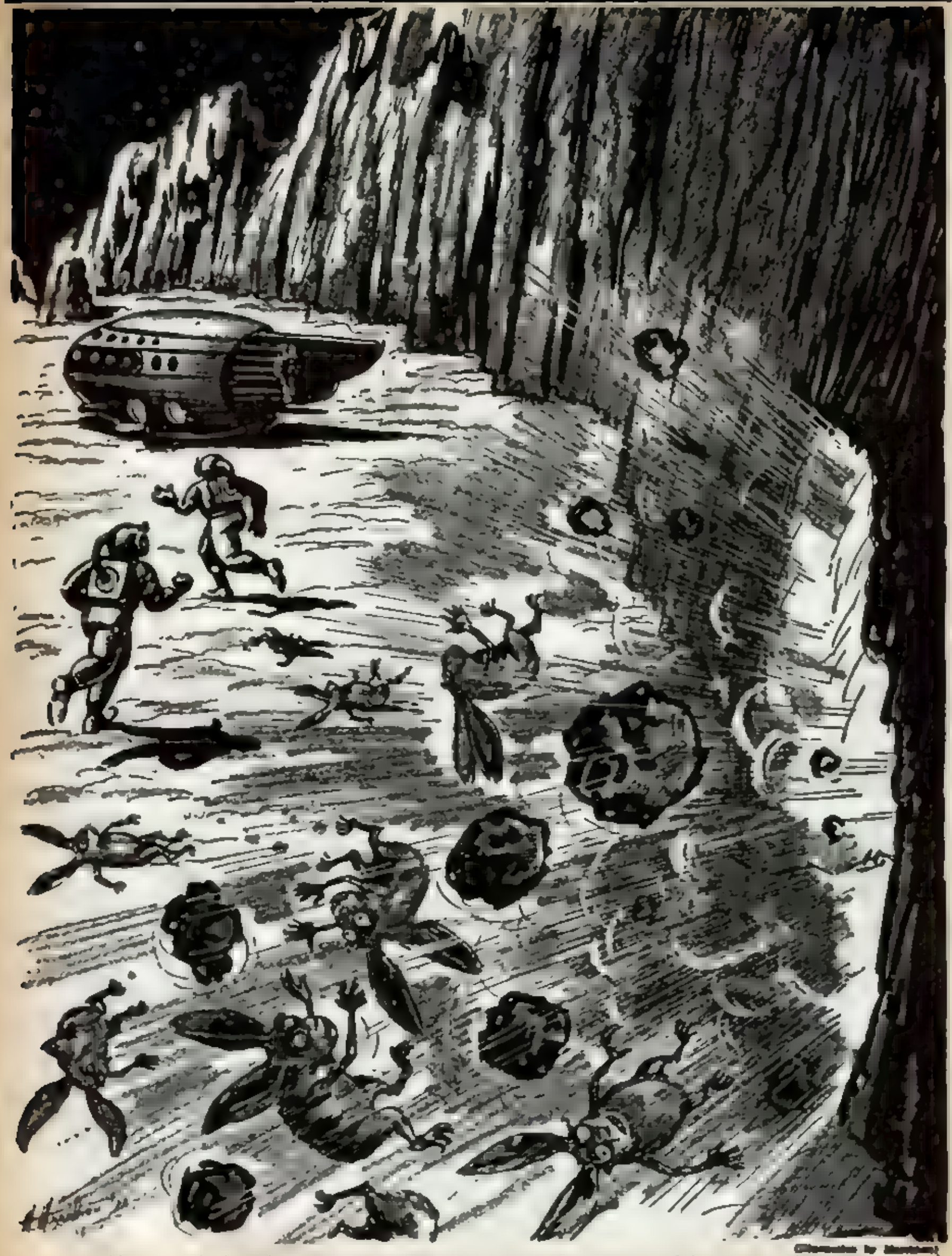
"As to that, Mr. Harrington, that has bothered me not a little, but I confess the Martian methods of procuring such priority are beyond my comprehension. All I know is that my filing of applications goes on without a hitch, and that any leakage of vital information must occur somewhere in the offices of the council on earth." Soderstrom attempted to stare right back at the S. I. S. man as he spoke, but found himself forced to drop his eyes to that searching, soul-revealing gaze.

"Soderstrom, someone in Station No. 7 is the responsible party and I've pretty well settled it in my mind who it is . . . " The overseer blanched and wet a pair of dry lips. "Wood . . . come in!" called the S. I. S. agent. Wood entered, he had been right outside the door, and took the seat offered by Harrington. He shot a scornful glance at the overseer as he sat down.

"Now . . . " Harrington was deliberate, "Soderstrom, when Wood called you the day he disappeared, did he not say he had found a valuable claim?"

"He did not." Soderstrom nervously spluttered those three words as Harvey Wood looked at him balefully.

(Concluded on page 885)



He ran with the other men when it was time. The geese got some of the Mece; and then there was the concussion and the falling rocks.

THE FORGOTTEN MAN OF SPACE

By P. SCHUYLER MILLER

● Most of our stories have pictured human beings roaming the solar system encountering strange forms of life and coming into more or less conflict with these extra-terrestrial beings. Our explorers fought them as members of the human race, bound by the link of our common heritage. It was human beings against non-humans.

Yet suppose a situation occurred in which some human beings could not stomach the greed, the cruelty, the treachery of their brethren. What would they do if there was a life and death struggle between humans with whom they were out of sympathy and non-humans for whom they felt the greatest affection? That is the theme of this absorbing and colorful story. Written in the style of S. Fowler Wright of "Deluge" fame.

● In the shaft it was pitch-black but for the glow of radium in the rock—low-grade stuff that they couldn't afford to take out—and the white beam of the torch. Here in the shaft there was enough dust to show the beam. Outside, the clear desert air was almost dustless and the beam of a torch was almost invisible save on the darkest nights.

It was hot and stuffy in the heavy lead-lined suit. Now that the mine was gutted there probably wasn't enough radium left to harm him, but it paid to play safe. The first prospectors had paid for their carelessness—paid horribly with their lives. Cramer shuddered. That wasn't so long ago!

He turned and went back up the long, slanting tunnel toward the spot of daylight that marked the entrance. Gronfeld was wrong for once. The electroscope wasn't down here at all. As a matter of fact, he, Cramer, had taken it up to the hut when it showed that the lode was played out. If Graham had brought it back again as Gronfeld claimed, he probably knew where it was and was keeping quiet out of spite.

Cramer frowned. When they started out, three long Martian years ago, there had been a tie stronger than lust of profit binding them together. Then Gronfeld found the lode and it turned out to be fabulously rich. There were millions for all of them. They had lost it once—one of Graham's blasts opened a lateral seam that had them fooled for a while—but just as they were ready to give it up and cash in on what they had, Cramer had found the main lode. There was no mistake about it now, though. The mine was gutted—empty. And they were rich for life!

That earlier *camraderie* had died out after they struck the claim. Gronfeld and Graham had hung together longest—they were a lot older than he and had different tastes—but of late their gruff monosyllables had grown harsher and shorter and their tempers testier. They seemed suspicious of each other. Neither one could go out without having the other trailing along, watching him like a hawk.

They checked and rechecked each gram of the rich ore with what seemed to Cramer to be childish exactness. As if in that huge fortune a gram or half a gram made any difference! They were dealing in millions—not tens and hundreds! After all, though, they were getting along in years and they'd led a pretty tough life. You had to make allowances.

He stopped at the mouth of the shaft to squirm out of his suit. Instinctively he turned to where the locker should be, then laughed aloud. No more of that! This was just a hole in the rock now. The suit went in the ship, and in a few minutes they would be thundering across the desert to Lanak and the canals—and then home. Home! God, but Earth would be good after six years in this barren hell!

He stood looking out over the fantastic, tumbled badlands that reached away in red confusion to the horizon. Horizons were near on Mars, even in the great sea plains, and the clear air made them seem nearer. Without some kind of rocket-ship no man could go into those eroded red wastes and live. None but a giant.

There had been giants in the first days of men on Mars—men who had gone out into the desert and lived and after years returned to die. They had made beasts of themselves—brute animals living from hand to mouth, stalking the weird half-reptilian creatures that roamed the gorges, finding water in secret places and drinking blood when there was no water. It was a killing life, but they lived it.

Thanks to the rockets that was all over. Even the poorest desert-rat could afford a tiny ship with water tanks and storage for a pay-load. Down there at the foot of the slope was the hut, and beyond, around the spur, would be the ship, hot silver in the sun, waiting for him. Gronfeld must have found the 'scope by now—probably Graham had remembered and told him. They'd be impatient, waiting for him to get back. Then up and away into the black skies, and all the misery of those six long years would be gone and forgotten. Forgotten! As if a man could ever forget in the desert—.

There was new life in his stride as he went up over the worn red rock of the hillside toward the place where the ship was. No need to go by way of the hut. Its rude walls of heaped talus were deserted and its smoke-hole gaped empty. He was done with that and all like it!

Straight over the spur and down to the ship—that was the way. And then—home!

His wiry arms drew him up to the knife-edge of broken strata that edged the cliff. Anticipation was tingling like fire in his veins. It was great to stand here alone, high above everything, and then to look up into the black sky and let your eyes drop slowly down—down to the horizon—down to the red desert—down to the sculptured hills with their spidery gullies—down at last to the silvery ship nestling under the cliff! He closed his eyes. Up now, and open them to the hard sky, and now down—down—down—

The ship was gone!

● Forgotten. Oh, but it was bitter! It was an old story in the desert—one partner too many when there was a rich pay lode—one who could be conveniently "forgotten" until it no longer mattered. No one could prove anything when the desert was done with him. There was no one to care.

He had the hut, and it was cold and empty, without fuel and without food. A few empty cans on the stone slab that had been their table, a shrinking stain of dirty water on the sanded floor—no more.

He had the mine, and it was empty, a gutted seam in the cliffside with its pale glow of wealth fading away. A cluttered heap of rock from the last blast, after the electroscope had showed that the lode had petered out, a dribble of black ore-dust on the floor of the tunnel where a can had leaked, thin echoes clattering along the walls—no more.

He had one feeble hope of life—no more.

There was no water at the mine. While they were scraping feverishly at the side of the hill, wondering what they had found, what the ship carried was enough. When black millions stared at them from the red rock they knew that it would be but a drop in the gallons they must have. They had to find water and they must have food.

They found them beyond the horizon—the riddled, cavernous limestone that marks the buried streams and ice-caves of the Martian desert. They found the sprawling brown vines and fat pods of that nameless plant that has been the life of more men than history can ever know. And for three long Martian years—years twice as long as those of Earth—they lived on water and Martian peas.

In an hour the ship had gone and returned with its tanks heavy with water. Half an hour to fill them—it meant at least a hundred earthly miles, doubled and trebled by the tortuous gorges that lay between. It meant ten days at the least. Most of those ten days would be waterless and all of them would be without food.

There was water in the mine-shaft—a single can. They had forgotten that too. Slinging it over his back in a twist of dried vine he went down past the squat red hut into the red desert. The sun was slanting down from the zenith and the long shadows were creeping out from beneath the rocks.

. . . . . .

Cramer lay flat on his blistered face in the red sand close under the edge of an angular spur of sandstone. Ten suns had climbed ponderously to the zenith and wavered down. Ten bleak nights had frozen the blood in his veins as ten burning days had boiled it. Ten days he remembered, five of them made horrible by the thirst that was drying up his skin, shriveling his flesh, clogging his mouth and throat with his blackened tongue and plugging his nostrils with caustic dust. Five days fusing together, merging into a red, warped blur of pain and heat and thirst, riddled with crazy visions, wracked with cruel memories—five days of hell.

Only God knew how many more there had been.

It was day now. His mind was very clear—crystal—clear and keen. Everything stood out in his brain sharp and clear and hard, as though he were feeling them with his fingers or with his swollen tongue. Every little nerve in all his body vibrated with pain and every muscle was withered by his thirst.

Thirst burned in him like a great never-ending fire licking up through his throat and mouth and nostrils into his brain. It was like a torrent of little ants, desert ants, sand-ants, swarming over his helpless body and tearing at it with venomed mandibles—a flood of many little units merging into one, yet all distinct. Every little pain in all his tortured body was a unit of the great red thirst-pain—every one distinct and clear in his brain. He could count them, if counting had not ceased to exist, if all meaning had not been swallowed up by the avid little pains that were part of the great pain that had become his body.

There was a picture in the back of his eyes, against the retinas. He could feel it there. It had lain there, motionless, for as long as he could remember since his brain had become clear. He could not change it, for the muscles of his eyes were dry and paralyzed by the little pains.

● It was a picture of cliffs. Red cliffs rising up out of a tumble of broken rock into the black sky. Pink cliffs, cooler and whiter than the crimson sand that lapped hungrily at their base. Grey cliffs, dusted over with red dust and permeated with red. Limestone cliffs laid down in unremembered centuries in the depths of an unremembered sea. Bodies of sea-things, pulpy and white, showering down out of the cool green gloom and through the slow ages being pressed and twisted and broken into cliffs, high cliffs red with the red dust of seeping iron—red marble cliffs cut into fantasy, hollowed with caves.

He examined the part of the picture that had to do with caves. They were peppered all over the face of the rock and crowded under its tilting, time-eaten ledges. The cliff was rotten with them, big and little, black mottled against red, dark and cool and moist in the bright desert. They ran back and down into the rock and at the bottom there were slender rivers running in the dark, and long lakes arched over with shadows, and in one of them dripping columns of sweet coolness—of ice—of life!

He knew the caves. He had come before, in the ship, with Gronfeld or with Graham. He knew the caves. There was life there—the flowing life that had been in his veins, that the sun had sucked out, and the red desert, in the blurred, waterless days before his brain became clear and he was lying here. There was water there. *There was water!*

In the desert there was death.

The hard, clear, bright picture in the back of his brain was blurring over with a sort of red-black veil, like clotting hot blood pouring down over his open eyes. The

shadows of the caves were melting into the shadows of the cliffs. The cliffs were swimming in redness, melting into it, swirling fantastically in a vortex of swift, undulant motion. The desert and the cliffs and the cool caves of the cliffs and the hard black sky—all eddying into one, into a great red stain against his retinas, into a vast red madness in his brain—all swallowed up by the thirst-pain that had become a huge red Thing eating—eating—eating—

The red swirl melted mercifully into darkness.

There were dreams in the darkness. Not sight-dreams—not red visions—but sound-dreams. Little sibilant shufflings in the sands. Little clickings on the rock. Little excited whisperings and breath-hissings. And then there were touch-dreams. Little gentle fingers pushing through the pain. Little swinging motions, short and hurried and breathless. And then coolness. And then no dreams.

Cramer woke to the cool vision of myriads of eyes. They were round eyes, big and phosphorescently green in the darkness. They had narrow pupils that pulsed and fluctuated as they stared at him, widening slits of black against milky yellow-green.

The agony of thirst was fading. Moisture was in the air and in the cool stone on which he lay. Moisture was dripping musically on crystal, its sound singing in his ears. Moisture was trickling through his broken lips, over his swollen tongue, into his thirst-seared throat. Moisture was soaking into his parched skin and into the muscles under it, and into his hungering vitals. The eyes were giving him life.

He moved, painfully. The eyes receded and their pupils became fine lines, fear-lines. The trickle of moisture through his lips slobbered and stopped. Eagerly he ran his tongue over the stain of water on his chin. Pain made him draw it back. A thin whimper whispered in his throat, and from the darkness a whisper answered, like the mewing of kittens very far away. The eyes came closer.

Two of the eyes were just above him, very close. There was a greyness beyond the dark. Against it was the rounded silhouette behind the eyes—a small round head with great fan-like ears—a small, stout body—thin arms. There were hands and there was something in the hands. It approached him. The trickle of water began again and the other eyes came close to him, beside him. There were soft, deft touches of little fingers on his hot flesh. There was the caress of cool water. He raised his hand. His finger-tips touched fur, soft and warm, that flinched and then steadied. Sleek muscles moved under the fur. Blood pounded.

Cramer drifted into sleep.

Many times Cramer woke to the grey dark and the slow trickle of water on his burning body. Once he ate something soft and rather tasteless that woke a gnawing hunger in his vitals, but after a little that subsided into the dull throb of the thirst-pain that was being washed out of his soul. He slept again.

When he woke the clearness had come back into his brain. It was a soft clearness, like deep water, not hard and brilliant as it had been in the desert. He saw things gently and his body responded drowsily to what he saw. He moved his hand, and it stirred lazily, as through water, with a sort of voluptuous, dull ache throbbing through it as the muscles contracted. He let it fall again and rolled his head toward the greyness.

The dark arched above him and the greyness was a soft blur against it. A thin column of water dropped down out of it to spatter on unseen ledges and spray his body with its delicious coolness. Far up where the grey began, as though at the end of a long shaft of pale mist, was a spot of bright white. There was a pink flush against it—a sort of glare reflected from some invisible source very far above. That white stain was digging into his memory. He closed his eyes and let his mind drift back in the blackness. Then suddenly he knew.

He was in the ice-caves.

He had been here before. The picture came to him—the great cave above, opening under the overhang of the cliff, its mouth always in shadow—the green-white ice welling out of the crannies of the rock, glistening with moisture, reflecting the flush of the desert—the little rivulet of clear water dropping into blackness. He had gone down, far down, on a rope of twisted vines. He had seen the ice as a pale white blink at the end of a shaft of grey and felt the mist wafting up from far below. But he had not found the bottom.

CHAPTER II

Across Martian Deserts

Now, when he opened his eyes, it seemed to him that he could make out the shape of the cavern where he lay. It was a great hollow dome, sheer-walled, cut away by eddying water. There were dark spots along the base of its walls—tunnels, leading down. One of them was grey. And the eyes had disappeared.

He rolled over on his face and drew his legs up under him, stiffening his arms. He rose on all fours, then tottered back on his knees, wavering dizzily. The nausea passed and he put out an exploring hand. There was a low rock quite close to him. With a heave he was on his feet.

The cavern was suddenly much smaller than he remembered it. The roof swooped at him and the walls rushed in. Only the shaft of greyness stretched endlessly up, unchanged. It was as though he had been a little flat thing of two eyes and a brain whereas now he was a six-foot mass of flesh and bone, a man. The idea started a little feathery tickling at the bottom of his brain. It was funny! He laughed—a great roaring, echoing laugh that rocked thunderously about him.

There was a sudden wave of motion. The grey tunnel went flickeringly black. There was the click of tiny claws hurrying on stone. There were the kittenish mewings, alarmed and plaintive. There were the eyes again.

They swirled about him in the dark. There were shapes that he could not make out, moving swiftly. The narrow pupils were dilated—questioning. The hurrying forms pressed closer. Little hard hands pushed at his calves and knees. Clusters of paired eyes hovered about his thighs. Tottering precariously above them, he shuffled forward.

There was a large tunnel that twisted steeply upward, too tortuous for any light to filter through to the inner cavern. When they saw that he went willingly, the little creatures ceased their pushing and pattered ahead through the dark, leading the way. At a fork in the passage they crowded into the false path, staring silently up at him.

Then light came suddenly around a hairpin bend in the tunnel and he saw them.

They were like rabbits. That was his first thought. They had small, blunt heads with huge round ears, and red-brown, furry bodies. Their hind legs were much like those of an earthly rabbit or squirrel, shaped for agility and speed, but their feet were like monkeys' feet and their fore-limbs were to all intents and purposes arms —human arms—with tiny furry hands and blunt nails. They had no tails.

If their hands were human, their faces were elfin. There were the great glowing eyes, slightly protruding, and there were stubby noses, soft and flat like rabbits' noses. Their mouths were round and pursed with square white teeth. They seemed to wear a perpetual grimace of whimsical amazement. A "whimace," Cramer called it, thinking smilingly of his "Alice in Wonderland" with its aptly coined words. The light-colored tufts of fur above the big round eyes helped to make their faces elfishly ridiculous. Cramer never forgot that first impression of scores of tiny furry fairies scuttling about on squattering legs, waving their furry hands in excited gesture.

He looked down. At the base of the cliff, crowded into the narrow band of shadow that lay between the sheer rock and the desert, were hundreds of the little creatures, staring expectantly up. They were waiting for something—for someone. He wondered if it were he.

Then he saw something that made him gape. The little beasts stood erect on their bent hind legs, like a rabbit or a squirrel squatting on its haunches. That was a natural enough posture in animals of the type that they seemed to represent. But they were not animals!

Slung over their shoulders were little fiber bags, woven out of the tough bark of the vines that swarmed over the bottom of the cliff!

He stared down at those that surrounded him. They too had bags—were shouldering them from a pile in a nearby cave-mouth. Five of them came struggling out of the depths of a crevice, dragging something huge and unwieldy. Then and there Cramer lost his last doubts as to the intelligence of these creatures of the desert.

They had woven a bag for him!

He examined it closely before he followed them down the sheer face of the rock to where the main group waited. It was like burlap, though coarser, woven crudely out of twisted strands of bark. It was crammed with fat pods of the big brown Martian desert-pea that grew so profusely under the cliffs, and in a sort of insulating blanket of heavy leaves was a spongy fungus-growth, its fine pores saturated with water. Cramer realized that his long trek through the red desert had not ended.

The sun was low and they traveled in the shadow of the cliff until it merged with the red sands. Then strung out in a straggling caravan they headed out into the desert. From his place at the rear of the long line, Cramer watched their tiny rounded forms bobbing far ahead against the dunes. They moved with an elastic loping hop, very much like the rabbits they resembled, but with their sacks they seemed to him more like a caravan of gnomes, packing a fabulous treasure across a coral sea.

With night they came together into a compact group with Cramer at the center. They could see in the dark as well or better than in the glare of day, but they realized that he must be guided and chose their pace accordingly. When day came and the sun glared at them over the edge of the desert, they turned aside into a labyrinth of gorges where there were crannies and burrows and a shadowed shelter large enough for him.

They ate little and drank less. Cramer realized the necessity of that. Because of his stumbling presence the distance covered by their night-marches had been cut by more than half. They were on half-rations, yet they did not desert him or try to hurry him. These little beast-creatures showed more consideration than most men!

● Six days brought them out of the desert into rock country again. Their water was almost gone, but more than half of the food remained. What did it mean? Why had they started on this tedious trek across the desert face of Mars? Why did they carry a burden so much greater than they needed? It puzzled him.

He could see that they were growing uneasy. They were behind schedule, and it seemed to make a difference —a big difference. He sensed impatience and a shade of regret growing in the big round eyes that stared up at him in the dark. And he resolved to do something about it.

At evening of the sixth day they were assembling in the lee of a crumbling bluff, waiting to take up the night's march. Cramer hauled himself out of the nook in which he had been sleeping and beckoned to his neighbor, a large male with a broad black line down his back. With the little creature at his heels he strode over to where the leader of the caravan was assembling his followers. Squatting in the sand before them, he pointed off in the direction in which they were going, then to the waiting throng. He moved aside, out of the line of march, taking his black-backed friend with him, and made an imperious dismissal. Then he waited.

He had to do it again before they realized what he meant. Then he saw understanding dawn on the little leader. A flurry of excited mewing ran over the crowd of watching creatures. The leader seemed to be conferring with those nearest him. Then two of the older males separated from the group and came over to where Cramer sat with the black-striped one. There was a piping whistle from the leader and the line got under way, loping over the loose sand at a speed at least twice as great as he could make. With his three guides, Cramer followed as fast as he could manage.

Three nights later they reached their goal. They had cut through a wilderness of rotted sandstone, its tortuous gorges heaped with sand and strewn with talus from the tottering crags that lined them. Cramer's sense of direction was long since lost, but the three who guided him seemed to be certain of the way. About midnight they reached a sheer wall of red-ribbed white rock—the only white rock Cramer had seen on Mars. A dark line split it from top to bottom, a great fault in the planet's crust. A foot or less of space separated the sheer walls. Into it his little guides vanished. With a moment's hesitation he followed.

He had to sidle along like a crab, dragging his pack after him. He had to twist his feet around and fit them into crevices that threatened to seize them and hold them forever. He had to inch his way up fifty feet and more to where the crevice widened enough to let him through,

or squirm along on his side through a mere rabbit-hole with three pairs of eyes peering anxiously out of the dark. Finally, lame and sore in every muscle, he reached the end and tumbled headlong out on the ledge that ended the fault.

Ages ago a meteor had crashed into the center of a limestone butte, throwing up a shattered, weirdly broken wall of rock-wreckage and filling the bowl of the resultant crater with rock-dust finer than fine sand. The force of the impact had split the plateau along an old fault-line, opening the crevice which was its single exit to the outer world. Here in the hidden crater was the secret sanctuary of the little red-brown rabbit-men.

They were busy now—furiously busy. The floor of the crater swarmed with them, crouching close over the arid soil, scratching and prodding, shuffling queerly. Cramer could not see what they were doing, but they reminded him of a flock of hens pecking and scratching for grain.

His simile was poor. They were sowing, not reaping. A sort of insane frenzy seemed to have possessed every individual of the tribe. Piled in confusion against the walls of the crater were the dry stalks of a previous harvest. They looked queer—blighted. They had lost the sere red-brownness of the normal vines. A black dry-rot stained them, a powdery dust eating them away. Many were contorted by huge knots and boles. Something had gone very wrong with that last harvest. It was that something that had sent the males of the tribe hundreds of miles across the arid face of Mars to find new seed. It was that something that had brought them to him and saved him from the terrible hunger of the red sands.

From the vantage-point of a cave-mouth high on the wall of the crater, Cramer watched the planting. With their strong, nailed feet the males threw out the powdery rock-dust in long straight furrows. Behind them came their mates, strewing the seed with skillful hands. A sudden thrust of their stubby thumbs shot the peas from their pods; a double shuffle of agile feet covered them. At intervals of a few inches were buried large chunks of the porous water-holding fungus. Water was the greatest problem of the little half-human people—was, in fact, the greatest problem of any thinking race that would try to conquer the dying planet—but they seemed to have solved it in a way all their own.

Cramer learned more of that fantastic, frenzied ceremony of planting in the years that followed—ten long Martian years in which he came more and more to be one of the desert folk—the Maee, as his rude tongue translated their mewing call. They had a language of a few simple words, supplemented by signs and shrill expletive cries and whistles—emotion-sounds. They had a rude social order with a chief-leader and a nobility of the older and wiser males. In a sense they were monogamists, although with each recurring spring there was a mating ceremony in which many of the younger creatures took new mates and discarded old ones. Few of the older members of the tribe participated, squatting in their dark cave-mouths beside the mates they had chosen for life and staring owlishly down at the weaving, darting shadows on the crater floor.

● They had no fire—no tools—and as far as Cramer could discover no religion or superstition. They were animal—and yet they were not animals. They twisted bark into cord and wove it into bags, but they knew nothing of cloth and wore no clothes or adornments. They planted the desert peas and in the long dry fall reaped their harvest, but there was no use of plow or spade. Their only implements were their feet and their clever hands.

The peas were the only food they had. Each harvest was heaped high in the dry, cool cave they had allotted to Cramer. Here they came when they were hungry and took what they needed. Cramer could never discover their system of rationing, yet system there must have been. As if by instinct each creature took what was proper and no more. In the beginning Cramer had thought to make their life easier by applying his human intelligence to the apportionment of the food under his care. There was never any need for that intelligence.

They lived to eat and they ate to live. So it seemed to Cramer. Whatever pleasures they might have besides the annual ceremony of mating meant nothing to him. Their psychology was not his. Superficially he became one of them, sharing in their simple work and feeding from the common store, but never in all the years he was with them did he really see into their minds. He was never really sure that there were minds for him to see.

Always he returned to the puzzle of the planting. He learned other facts—saw other things that helped a little to interpret the meanings that he could not see—but the real problem never changed. It was not a question of water. He had soon realized that. In some of the deeper caverns there were springs with water enough to keep them alive but none to spare. Once a year, over a range of about ten days, the underground sources were replenished by the melting polar ice, thousands of miles away. In those ten days they must plant—must sow their seed with its accompanying sponges of water. What moisture it gave was enough to sprout the peas.

With uncanny speed the young plants thrust their rootlets deep into the powdery soil, far down to the buried watercourses. By the time the fungi had rotted away and given up the last of their absorbed moisture, the desert-bred peas had reached a supply of their own. By that time, too, a second planting had become impossible. There was no longer water to spare for it.

That explained much—the impatience of the little creatures as time passed and their straggling caravan was still far from home, the extra seed that they had carried, the importance of the planting ceremony to their simple lives. It did not explain why they had treked hundreds of miles across a waterless desert for that seed. It did not explain how they had come to find him.

As the barren seasons rolled past Cramer lost all count of time. He was a machine—an automaton—feeding, watching, dully wondering. He saw that that first harvest was incredibly rich. The stout brown vines were covered with swollen, heavy pods. The thick leaves grew huge and had a metallic sheen. The ordinarily minute blossoms grew into gigantic purple blooms that flooded the crater and the caves with a cloying, suffocating perfume. At harvesting Cramer had to find another cave. The granary in which he had been living was filled to overflowing.

The second year the purple flowers were smaller and their perfume less powerful. Some of the vines died and

on others the leaflets were stunted and withered. Most of the peas were still enormously larger than any Cramer had ever seen, but there were a few, commonest near the center of the crater where the land was lowest, in which the pods were small and many of the peas shrivelled and dwarfed.

Year by year he watched the blight spread and the harvest dwindle. There was still food enough for the little colony, for those rich, early harvests supplied food for more than two years as well as seed for the planting. But there would not be enough for long. All of the peas were dwarfed now, and most of them were black and glossy as the leaves had been. Then in the fifth year a black stain appeared on the vines nearest the center of the crater and spread swiftly.

A powdery black dust consumed leaves and stalks and withered the roots. The peas were small and hard and black, with a bitter metallic taste. They would not sprout. That year, when the floods came and the water rose in the deepest caverns, half the tribe gathered for the trek across the desert in search of new seed. Cramer went with them.

When there was water enough to saturate their sponges, they went. Cramer's eyes had long since adapted themselves to the life of darkness that he led and there was no delay because of him. In three days they covered the distance to the water-caves where they had found him ten earthly years before. For a single day they rested, filling their sacks with seed and replenishing their water. In three more days they were back at the crater. The water had subsided, but the females and young had stored away great quantities of the spongy fungus, saturated with water, in readiness for the planting. It was cool in the lower caves, but the water evaporated rapidly into the thin air. The year when he had come the caravan had returned barely in time. Another day or two and there would not have been enough water. That year many would have died.

CHAPTER III

The Forgotten Man Acts

● Ten Martian years—. On Earth that time would be almost doubled. Cramer's name had long since been forgotten in the home-world that he had loved. Among the Maee he was taken for granted—almost one of their own kind. Then for a second time he went with the seed-seekers.

They came up out of the desert to the long, low line of red cliffs, pale rose in the starlight. A great wave of heartsickness rose in Cramer's throat as he stood there under the towering wall of rock, staring out across the sands to that horizon which hid the hillside where he had been "forgotten." Above him a great star glowed softly white among the steel points of the constellations —Earth—his home. Crouched there at the mouth of his cave, the horizon lightening with the sunrise, he remembered Earth and men.

The Maee were weirdly manlike, but they were not men. Every day he discovered new humanity with them, but he could not forget the animal beneath. He longed for the heave of sullen seas against granite cliffs with the wind swirling in his ears and the scent of the pines in his nostrils. He longed for the lingering, fading tints of evening and the slow flush of dawn. He longed for the beauty of the moon, cheese-white against a bowl of cobalt, diamond-studded. He longed for blue days when the sky-lanes were strewn with cloud-castles and for the softness of a night in which the stars were not hard, bright, watching eyes. But most of all he longed for men.

The Maee had a language, but he could not speak it or understand. They had a life of their own, a society, but he was alien to it. In the long red days when the Maee slept and the sun shimmered over the brown vines he would sit and stare into emptiness, dreaming of the sound of a human voice, longing for human friendship, hungering for all the complex trivalities that go to make up human life. Men were somewhere there beyond the sands and the contorted crags. *He* was a man! But men never came.

He turned away from the sudden glare of the sunrise and went into the cave. Ice glimmered in the gloom. He went toward it, touched it. It was cool and soothing to his feverish skin. He could close his eyes and remember the coolness of Earth—cool moss under the green arch of the forest—cool shadows across the hillsides—cool streams among majestic peaks—cool flight in the spangled darkness above the clouds. He could still remember. It was all he had now.

He let his fingers trail along the smooth surface of the ice. A little thrill ran up from them through his arm, knotting the muscles. He stiffened. He felt the sharp edge of a fresh cut!

Men had been here!

By daylight it was plain. Men had come often—had come recently. They would come again. Or—would they?

All through the day he sat thinking. It was hard to think now, after all the years. He was old now. And there was no answer. The Maee could not help him—could not understand. He could stay, hoping against hope that men would come, living each endless day twice over, lying sleepless through the interminable night, wasting slowly away. He could go with them, and never know. In the end he decided to go.

But he must be sure! He must not let them come and go without him! There must be a way—! Laboriously, wakening the long-buried memories of a discarded life, he scratched his message in the thin sand that floored the cave. Then he went with the Maee.

They came! Day after day he clambered to the top of the cliff to watch, and one day they came! They were a steel-bright speck over the desert, glittering against the sky. They were an oval gem, tailed with fire. They were a smooth-flanked craft of steel, hurtling through the skies. They checked, settled slowly to the plateau. The side of the little ship swung open.

Men came!

There were two, young, prospectors as he had been. He was lean and dry and old, a withered skeleton with a grizzled beard. His voice was strange, even in his own ears. He had not heard it for very long. He saw them smiling, nudging each other as he babbled out his crazy, jumbled mass of words—all that had happened—all that he had seen—all that he had learned of the Maee—everything—anything—*anything* so long as it was speech, so long as they would listen! The old man was cracked—

he knew—but they were men. *They were men!* Tears were in his old eyes after twenty earthly years.

They gave him men's food and men's drink—canned meat and cold coffee out of cans—but it was better than the tasteless peas and the metallic, glowing water of the Maee. They put clothes on him and listened when he told them about the crater and the caves and the planting. They asked questions—polite, kind questions. They were being kind—kind to a cracked old man—kind because they were men—his breed—*men!* After twenty years, there were other men!

● He listened to what they told him, eagerly, hungrily. They told him about Earth—about wars—Europe all one nation—the yellow peoples growing strong and bold—the black race dying, almost gone. They told him about Mars of the canals—Lanak—civilization—new laws and new governments, and the new ways they had of mining, getting every last milligram out of the rock. "Soaking up the glow" they called it.

He showed them the crater and the caves and the Maee. The Maee were strange—timid. The squatted in the cave-mouths, watching. Their eyes shone out of the deep darkness. They moved away when he approached—even the old black-backed one—even his old friend. They were strange. But it didn't matter! He didn't care!

He showed them the things that he knew—the granary—the water-caves. He gave them food, peas from the granary—all they wanted. They filled their ship with food and took water, plenty of water from the caves.

They were interested in caves, especially in those that ran back under the crater. He was glad. He showed them all he knew—the place where the fungus grew and the tunnels beyond where there was light—caves too small for any but the Maee to enter. He had wanted to go in and explore, many years ago when he was still young. The tunnels widened beyond. But he was too big. These were men—clever, intelligent men! Eagerly he watched them drill and set their explosives. The Maee watched too, from the dark—myriads of round eyes watching from the dark. He ran with the other men when it was time, but the Maee did not run. They sat and watched from the dark till the glare came, and the noise.

The black-striped one was killed. Others died too—others that he had known for a very long time. The gases got some of them, and then there was the concussion and the falling rock. The fungus-beds were buried by the rock that fell. But the men took the dead Maee away to their little ship and came back with torches and instruments to explore the caves beneath the crater.

He did not go. Somehow, he did not want to go where the Maee had died. The years had made him different from other men, more like the beasts, like the Maee. He saw different things and thought differently. But they went, trampling over the fallen rock, and when they returned there was a queer hard lustre in their eyes.

They were men. They took him with them—away from the crater and the caves—home! The Maee watched them go, silently, from the cave-mouths. Myriads of green eyes glowing in the dark. He lay far back in the tail of the little ship, near the rockets, among the great piles of pods. The men were talking, whispering together, up forward in the control-cubby. He lay and listened to their voices. A half-dreaming glow of contentment enveloped him. He was a man again!

The big man was talking now. The big man was Barron and the young one was Galt. Barron had a harsh voice, slurred and coarse. It was like Graham's voice, years ago. Cramer didn't like it.

"It's lousy wit' the stuff!" Barron grated.

"Yeah," Galt agreed to everything Barron said.

"The's metals too—platinum an' that. I made tests. It was the big meteor brought 'em in."

"Think you can get it?" Galt sounded a little skeptical.

"Sure!" Barron didn't like being doubted. "You seen th' 'scope. Kicked clean off th' scale, didn't it? You seen th' little chunk from th' blast—big as a house an' just a little piece at that."

Galt's young voice was awed—sort of reverent.

"Gees!" he murmured. "It's like heaven, findin' it like that! Like a dream. Millions for the both of us, an' then Lanak an' the canals an' home. Earth!"

Barron was grating on—details—practicality. He was no milk-sop, dreamin' about home! "We c'n blast down through from th' top, right in th' middle where it's lowest. We'll save time that way, an' the's no chance of shiftin' the water. We got water there, an' food, just for th' takin', an' we don't want to lose it. By God, kid, we got it soft! An' millions for th' both of us!"

Galt's voice sounded a little dubious. "What food do you mean Won't blasting like that kill the peas?"

The big man roared with laughter. "Peas! Who wants th' lousy driedup swill? We got meat, kid—just for th' takin'! Rabbits. Thousands of 'em. Fill up that big crack wit' a couple good blasts an' they're there till we're done wit' th' place. We'll eat meat, kid."

Galt peered back over his shoulder. The old man was lying still—sleeping maybe. Crazy old coot! Living half his life over millions and never knew it. Gibbering about rabbits like they were men, and about peas—.

"What about the old guy?" he asked.

Barron leered knowingly. "Him? The's nobody knows about him but us an' nobody that cares a damn. We can forget him."

Forget!

Both men turned at the sound. The old man was trying to stand up. The acceleration pushed him back. He hunched forward on his knees. He was by the fuel-chambers, where the outlets bulged into the ship. He was laughing—crazy, screaming laughter.

Good God! *He was opening the air valves!*

. . . . . .

Over the red desert a bright speck blossomed into a great white puff of flame. After a little a sound came, thin and very far away, like the bursting of a rock.

A plume of fire streaked slowly down across the sky and vanished into the upflung chaos of the bad-lands. A fountain of light shot up where it fell, bright with specks of burning metal. Another sound came, deeper, the thin echo of a mighty roar.

The Maee were watching from the crack in the plateau that was the only entrance to their secret haven. In the dark their eyes were great and round—myriads of green eyes, watching from the dark. Somehow they understood what he who had lived among them had done for them.

THE END

THE MOON DOOM

By WILLIAM LICHTENSTEIN

WHAT HAS GONE BEFORE

● Wilfred Hartley, amateur astronomer notices a strange body approaching the moon's orbit. Unsuccessful in arousing official interest in it, he calculates that if it hits the moon it will send Luna possibly shooting toward the earth.

The invader turns out to be one of the asteriods, Ceres or Pallas about 300 miles in diameter that is plunging wild through space. It hits the moon, apparently breaks into fragments and topples the moon out of its orbit. For days the world watches in uncertainty and then it is perceived that it has turned inward in its path toward the earth.

Tidal waves begin to spread over the coastland. His Staten Island home submerged, Hartley makes his way over the Island toward New York. He saves Witherspoon, a young aviator, from some thugs, and with Witherspoon, in the latter's plane flies over New York to see the city almost submerged under water.

NOW GO ON WITH THE STORY

● New York, arrogant giant of the earth, was drowned in a flood of cold, green water! Nothing else in all the wild welter of events that followed brought home so vividly to Hartley a sense of impending doom, of immeasurable catastrophe to a stricken world.

Some few only of the tallest spires r e a r e d themselves drunkenly above the waves. They were black with tiny, gesticulating midges; terror-stricken people who had climbed to the highest points in search of safety, and found the gaping waters steadily rising to overwhelm them.

L o r d l y o c e a n l i n e r s, ungainly paint-scarred tramps, snorting tugs, their decks already swarming with r e s c u e d people, rocked their way over the sunken city in heroic attempts to save some more of desperately clinging humanity.

Young Dick Witherspoon swooped lower with some vague idea of helping. But there was nothing he could do; the plane was only a two-seater, and death lapped vengefully at their landing gear. Sick at heart, the two men swung close to the smooth steep pinnacle of the Chrysler Tower, heard the agonized appeals, saw the outstretched hands, saw man after man lose his precarious hold and slip into the silent waters, and were compelled to swing away again.

Not an instant too soon, either. For there was a tremendous cracking sound, followed by a grinding roar. The great gleaming spire swung in a slow majestic arc and toppled with a huge splash into the enveloping sea. Never was Hartley to forget the last screams of the drowning people.

"If only we had a transcontinental cabin plane," young Witherspoon groaned savagely, "we could have saved a few of those poor fellows."

"To what good?" asked Hartley bitterly. "We're all going to die soon. The earth is doomed to destruction. L o o k around you."

T h e illimitable ocean stretched in all directions as far as the eye could see. Nothing but water, green lapping water! No sign of man or his works except a few ships that staggered drunkenly, weighted level to the sea with rescued humanity. Even as the circling watchers bent over the cockpit, a great liner, pride of the transatlantic fleet, keeled under its u n b e a r a b l e l o a d, plunged headlong into the depths. More and more towers, t h e i r foundations weakened by the battering floods, made miniature tides as they fell.

Witherspoon, his round, young face

THE "MOON DOOM" GOES ON

The first installment of this "unfinished story" contest was written by Nathaniel Salisbury and published in the February issue. William Lichtenstein, of 3191 Perry Ave., Bronx, N. Y., has written the best second installment, and it is published herewith.

We want you, our readers and authors, to carry this story on in two more installments to its final conclusion. Mr. Lichtenstein has presented many hints here as to how the earth might be saved. He has carried on the plot and the adventures of Hartley and Witherspoon. The next job is up to you.

The following are the rules and conditions:

1. In this issue is the second installment of a story to run for two more issues. [The May and June, 1933.]

2. The third and fourth installments are to be written by our readers.

3. You are invited to write the third installment of this story which will appear in the May issue carrying on the adventures of Hartley and Witherspoon and the development of the "Moon Doom."

4. The third installment must be between 3,000 and 4,000 words.

5. For the best third installment which we will publish in the May issue we will pay ¾ cent per word, upon publication.

6. Everyone, whether he has contributed or not to our pages, who is not an employee or a member of the family of an employee of the Stellar Publishing Company, is eligible to join this contest.

7. The judges will be the editors of Wonder Stories, and their decision will be final.

8. The stories will be judged upon the following basis:

a. They must be reasonable, plausible, and written as closely as possible in the style of the first two installments so that one would believe that they were all written by the same person.

b. The best stories are those in which the adventures of our heroes, the course of the story, the science used are original, refreshing and exciting. We do not want impossible rays, machines, or gadgets.

c. The earth is admittedly in a bad plight. What will happen, what can be done to save it? You are asked to develop that as cleverly as possible in the third installment.

d. The installment must end at a crisis, or at some point at which the narrative can be picked up in the fourth installment.

e. Because of the shortness of time we must insist that all entries into the contest of the May installment be in our hands not later than March 14.

9. No stories will be returned unless full postage is included, and a definite request is made for their return.

ashen, said: "What can we do now?" His voice was oddly quiet. "We've gas enough only for a few hours."

Hartley shook his fist at the great, overwhelming moon.

"You're responsible for this, damn you!" he screamed. His nerves were taut to the breaking point.

The onrushing sphere of destruction was by now completely risen over the eastern horizon. It filled almost half the heavens with its ominous bulk, its blood-red disk cast a sinister glare on the heaving waters beneath. There was no sign of sun, of stars, of anything else in the blotted-out heavens. It could not be over fifty thousand miles away, and it was dropping with accelerated speed.

Hartley turned sheepishly to his companion, ashamed of his outburst. He was about to say something, when Witherspoon, eyes staring, cried: "My God!" and swung heavily on the joy stick. The plane shuddered, tipped, and zoomed upward with a groaning of struts.

Hartley jerked his head eastward. A great wall of water, hundreds of feet high, bearing on its crest the shattered wreckage of countless ships, of obliterated European cities, was roaring down upon them. It crashed resistlessly upon the last remnants of New York, swirled with lashing fury not a dozen feet beneath their upward tilted plane.

"The last moon tide," yelled Hartley, and they were the last audible words for hours. For a screaming, howling wind enveloped them, caught the luckless plane in a grip of steel, buffeted it aloft, threw it into insane loops, shot it dizzily around and around until its two occupants, blinded, deafened, gripping their safety straps for very life, thought every moment was the last. Witherspoon shouted something, but it could not be heard in the crashing tumult of the wind and waves.

Then a storm broke in the tortured atmosphere. Great black bellying clouds scudded over the heavens, almost obscuring the overhanging moon; jagged lightnings blinded, the thunder added its gruff voice to the storm of sound, and the rain bucketed furiously to meet the upward leaping tide.

Hartley could never understand afterwards how they managed to survive. Drenched to the skin, crouching in terror, Witherspoon clung to the controls, but all he could do was keep its nose somewhat into the gale. For the rest, the elements were in complete control.

Above was the falling satellite, huge as a world, moving across the face of the heavens with visible speed; beneath was a grey spate of splashing heaving waters, jerking convulsively to the upward thrust of a tide-torn earth; and in between, a tiny speck in an inimical universe, the plane swung crazily.

It was over as abruptly as it began. The wind died down, the clouds ripped asunder, showing the fast vanishing bulk of the rushing moon over the western horizon; the sun beamed with impartial kindliness upon a rapidly ebbing ocean, and the plane, for the first time, straightened out into smooth flight.

● Witherspoon jerked wet hair out of his eyes, grinned wanly, held to his controls with fatigue-torn arms. He said to Hartley:

"*That's* over, and we're still alive."

Hartley shook himself like a drowned dog and answered dolefully:

"It's only a short respite. The moon is shooting around us in a rapidly contracting spiral. At the rate it's going, it won't be long before it'll either smash into us, or come so close that everything movable will rip right off the earth."

"And that will be—"

"Within the next ninety-six hours!"

Witherspoon stared down at the great, cracked mudflats beneath. They were still circling New York. The tide had passed westward with tremendous velocity, leaving what had once been a great city a twisted mass of wreckage and slimy mud. There was not a sign or vestige of life anywhere.

"If that's the case," he said calmly, "we might as well smash now and get it over with."

Hartley cast a frowning glance over the western horizon. The moon was a thin rim over the Jersey hills, overlaying their rolling crests with a golden flame. The sun, a curiously shrunken orb, was right on its heels. Twilight, a strange unearthly glow, cast its protective shadow over the ruin and desolation of the earth.

When the moon returned over the eastern border, it would all be over. It looked hopeless. Bitter thoughts coursed through Hartley's mind. Witherspoon was right. Why struggle to maintain life when the end was inevitable! Man, with all his strivings through the ages, would vanish from the universe; the green world would roll lifeless and shattered in space, a tomb!

Very well then, he'd do it! Tell young Witherspoon to head deliberately downward, smash into oblivion. It was the cleaner way! He looked up at the storm-washed sky to drink in a last draught of its cold, heartless beauty. The stars gleamed as softly and as steadily as if a sister orb were not agonizing in its last death-throes.

He took a deep breath, face still uplifted, the fatal words trembling on his lips, when he stiffened in his pose. An exclamation burst from him. He had seen something; something that he had not expected; something that changed all the current of his thoughts.

The young pilot jerked impatiently. He was still staring hopelessly beneath.

"Well, what do you say? Shall we crack up?"

"No! No! Not yet!" There was a strangled eagerness in Hartley's voice. That unforeseen sight of the remains of Ceres in the heavens evoked alternatives; so fantastic, so bizzare, so dependent upon a concomitance of circumstance, that he shrank from disclosing it to his unscientific companion! He would be thought mad, insane! For the fragments of the shattered asteroid were regrouping themselves slowly.

Witherspoon was looking at him with something of contempt, as on a coward grasping at the pitifully few hours there were to live.

Hartley said: "Trust me! I've just seen something; there's one chance in a million."

Witherspoon grunted sarcastically. "Don't tell me you've invented a rocket ship to take us to Mars to start life over again?"

"No—"

"Or that," he continued remorselessly, "you've found a mighty ray that will push the moon back in its orbit?"

"Of course not," Hartley answered sharply. "Nothing so silly as all that. There's nothing *we* can do to stop the moon. But—there are *other* forces. No use going into it until I've made calculations. Even then, granted everything, it's still a million to one chance. Want to try it blind?"

The round-faced lad looked at him shrewdly.

"Okay," he said briefly.

"How much gas is left?"

Witherspoon squinted at the indicators.

"About three hours' worth, or three hundred odd miles cruising."

"Good! Shoot for the Allegheny Mountains as fast as you can; try for Harrisburg."

The aviator turned the plane about obediently, and soon they were roaring westward.

"Why Harrisburg?" he shouted above the roar of the propeller.

"Because it has a Transcontinental airport; the nearest one that may be still intact. I'm pretty sure the tidal wave stopped at the Alleghenies."

"Thinking of grabbing the next airliner to Frisco?"

Hartley smiled wryly; his brain a turmoil of dancing figures, of vaguely forming plans.

"We *must* find a plane that has an enclosed, air-sealed cabin. And plenty of food and gas. That is the first essential. The next is time to do some very intricate calculations before the moon comes from around the earth."

The aviator shrugged resignedly.

"You may be crazy, and you may not. It won't make much difference by tomorrow."

They relapsed into fast steady flying. They had caught up with the tail end of the tidal wave. New Jersey was a sinister ocean from which emerged only the round wooded knobs of the hills. Tangled wreckage floated on the dark, star-lit waters. Once they caught sight of a red glow in the pitchy blackness that evidenced a tree-clad summit. The light winked out and glowed again, at irregular intervals.

Westward!

● Witherspoon knew code. He spelled out: *Help! Help!* in the reiterated, despairingly monotonous blanketings. A groan burst from his lips. There were men huddled on that last few feet of soil, perhaps women and children, sending out desperate appeals, cursing the plane that callously winged its way onward.

"I know how you feel," Hartley said softly, "but we can do nothing. Those poor wretches are irretrievably doomed."

On and on they went, the blackness of the night mercifully hiding the devastation below. They ran across no further evidence of life.

At last they were across the Poconos. The mountain tops were dry; the plains beyond soggy marshes as the water streamed back through the passes to the ocean.

It was nearing ten at night by the time they reached Harrisburg. There were no lights; the town was a sullen dark blob, but on the outskirts were scattered red flares; huge bonfires to warm and give blessed light to the terrified refugees who had managed to survive the first cataclysm.

Witherspoon knew the air field here, and he managed to set the plane down in the dark without injury to themselves, but its left wing and landing gear crumpled against an upthrown mound of earth that should not have been there.

They helped each other stiff-leggedly out of the wreckage.

Witherspoon said ruefully: "The plane's gone. We're through."

"It served its purpose," Hartley tried to be cheerful. "If only there's a cabin plane to be found."

Red flames danced high into the air at the opposite side of the field.

"Let's walk over there," the aviator suggested, "I can see people huddled around it."

He flashed his torch on the ground to light the way. It was lucky he did so, for the ground was tossed into jumbled heaps, criss-crossed with chasms whose depths the torch could not plumb. The pull of the moon had raised mighty tides in the solid earth.

Though the distance was not over half a mile it took them a full hour to make it, what with numerous detours to avoid plunging into the yawning pits.

"Halt! Who goes there?"

The voice came surprisingly out of the blackness as they approached the fire. It was followed by the business-like click of a cocked rifle.

"Aviators," Hartley responded. "We've flown all the way from New York and our plane cracked up."

"Step forward into the light and let me see you."

They moved slowly into the circle of illumination. The huddled figures had risen to their feet at the strangers' approach. There were three men and two women. A sixth figure came out of the darkness into the dancing shadows, rifle held at the ready. He was tall and grim, and he held his gun as though he were accustomed to its use.

"Dr. Downer!" Hartley exclaimed suddenly.

The tall figure glanced at him suspiciously.

"How do you know my name?" he demanded.

"Who doesn't? I've seen your picture time and time again. I wrote you at the Princeton Observatory when I first observed Ceres approaching the moon, but you never answered."

The famous astronomer lowered his gun.

"Eh, so you're the young amateur who made better calculations than the professionals." He extended his hand and they shook warmly. "Don't blame me," he went on to explain. "I was away on vacation; visiting my wife's folks here in Harrisburg. I knew nothing of what was going on except what was in the papers, and the soothing replies my colleagues at the Observatory made to my telegrams. Here, let me introduce you, then you'll tell me things."

There was his wife and her sister; the sister's husband; an elderly man and a young lad about Witherspoon's age, both friends of the family. Hartley introduced the aviator in turn.

"All that were saved out of our circle," Downer said gravely. "The catastrophe came on suddenly. The river rose and flooded the lower part of the city, but that wasn't the worst. There were a series of tremors that grew in violence until they culminated in an overpowering shock that seemed to split the earth in two. We rushed out here in the open; but most of the inhabitants are buried in the ruins."

Faintly in the distance other fires glimmered.

"Other refugees," Downer explained. "We have to be careful. There are prowlers around; desperate men who think the occasion one for looting and rapine. I was compelled to kill a man half an hour ago. Now tell me what the situation is on the coast."

Hartley ran over the course of events rapidly. Downer listened with grave thoughtfulness.

"It looks as though you are right," he said when Hartley had concluded. "The moon will either crash on the next few trips or come so close as to rip everything apart. It would be impossible to exist in the cataclysm; the ground will crumple into new mountain ranges to which the Himalayas will be pigmies. And even if the miracle should happen, and some of us survive, within the next few days, the moon must inevitably smash into us."

● There were murmurs of dismay from the little group. The famous astronomer had definitely put the seal of doom upon the world.

"I think there may be a chance," Hartley interposed humbly, yet with a certain eagerness. He felt singularly young and callow in the presence of the great scientist. "I saw something before we started from New York."

And he told Downer of the blasted Ceres in the heavens, that appeared just after the moon had gone down in a blaze of disaster.

The astronomer glanced sharply upward. The sky was clear of everything but the usual stars and planets.

"Eh, where is it?" Then he recollected, and his voice grew in restrained excitement. "You say you saw it right after sundown? Of course, that explains its absence now. Could you—could you," his voice was positively imploring, "give me its exact location and the exact time of observation?"

"I think I can, within limits," Hartley answered modestly, yet with a lump in his throat. "I jotted down the position and checked the time on my wrist watch. Of course, the position is only approximate; I had no instruments."

"The observations; quickly!" Downer demanded, stretching forth his hand.

Hartley gave him a slip of paper in silence.

The astronomer's hands trembled as he carried it to the flickering light of the fire. The others watched in feverish awe, not quite knowing what it was about, but feeling that somehow their fate, the fate of the world possibly, was wrapped up in the next few minutes.

"Time—6:52 P. M., April 27th. Place—New York City. Altitude—40 degrees; Azimuth—65 degrees. Hmmm!" He turned with a dubious shake to Hartley. "It's something, young man. But one observation—"

"I took three more on the flight here," the young man interrupted timidly. "Of course I could only guess at what town we were near each time." And he handed over several other slips of paper.

The scientist's face cleared magically. "My boy," he said warmly, "you are a genius. I predict great things—" He stopped short, shrugged and smiled a little. "That is, if we live."

For a long time he studied the figures. At length he roused himself.

"They are wretchedly inaccurate; naturally," he murmured, half to himself. "But with four observations, there is a chance that the inaccuracies neutralize each other. Can we plot Ceres' orbit around the moon and earth? It might be possible, yes—quite possible—to make the necessary calculations with a fair degree of success."

Then he stared at Hartley. "I forgot," he remarked dully. "Even if we *do* know the course of events, of what benefit will it be to us? At the best the earth soon will be torn in titanic convulsions."

"I have a plan," said Hartley, and he took the scientist aside. It was so wild and improbable that he felt the others would turn it down at once.

As he carefully unfolded it, Downer's face was a study in growing astonishment. Several times he was on the verge of interrupting angrily, but long training impelled him to hear it out.

When the young man was finished, he was still skeptical, but he managed to evoke a faint smile and a shrug.

"After all," he said finally, "it's a wild, crazy scheme; the most outrageous I've ever heard, but—we are doomed to die anyway."

"Then you agree?" Hartley asked joyfully.

Downer took a deep breath.

"At least let me get my calculations finished. And—young man, there is just the plane you require at the southermost end of the field. The hangar somehow managed to survive. Now I wish for several hours of uninterrupted silence while I proceed with the calculations."

The young amateur's heart bounded with emotion. *His* advice, *his* plan, on such involved, technical matters was being taken by the great astronomer.

"I think, sir," he said quickly, "it would be better if we transferred at once to the plane. We could start getting our supplies together, and you would have a better place to work in."

The distinguished scientist looked at the young man with something of admiration.

"Very well," he said abruptly.

Back to the fire they went, and Downer announced to his little group that they were moving at once. He vouchsafed no further information, but they obeyed quietly. If there was any fear in their hearts, they managed to lock it safely out of sight.

It did not take them long to pack their pitiful salvage out of the catastrophe; some blankets, a bit of extra clothing, some tinned food, a noble ham hastily wrapped in a tablecloth, and a jug of water. Downer's younger friend had a small automatic, and Witherspoon possessed a thirty-eight Colt.

It took them two precious hours to grope their way over the earthquake-scarred terrain, narrowly escaping one thunderous landslide almost at their feet. Several times they encountered prowling bands of marauders, who shied however, at the sight of their armament in the gleam of the flashlights.

Harrisburg was by now a mass of flames. The smoky glare lit up the heavens and afforded some measure of light.

"Looters!" Downer said briefly, with compressed scorn in his voice for beings, who, in the face of impending disaster, thought only of greed and lust.

● To their immense satisfaction they found the hangar intact, and the cabined plane, one of the smaller transcontinental fliers, seemingly in good condition. All about the hangar stretched a long, irregular, encircling fissure, which in places seemed to lead directly into the innermost bowels of the earth. That no doubt was responsible for the plane having escaped the marauders. But Witherspoon, searching carefully, discovered the perilous trail that led to the bottom at the narrowest part, and up the other side.

He installed himself in the plane at once with grunts of delight, checked everything carefully.

"She's okay," he said finally, "I can handle her." The

tanks were fully loaded, and there was an ample store of tins of gasoline on the premises so that the fuel problem was solved.

Hartley meanwhile was paying minute attention to the cabin, going over it with a fine tooth comb to make sure that it could be hermetically sealed. Luckily it was the latest type machine, built for flight at the twenty and thirty thousand-foot levels, and as a result the cabin was built specially to conserve air. There were even oxygen tanks on board in case the air staled too rapidly during flight.

Downer was hard at work at an improvised table in the hangar, using flashlights and sticks of wood soaked in gasoline as torches to give him light. He scribbled furiously, paused, frowned, swore deeply, scribbled figures again.

Hartley organized the others. The women he set to work storing things within the cabin as compactly and neatly as possible. The elderly friend, whose name was Murchison, he left on guard with the rifle. Downer of course, remained too. The others: Witherspoon; the sister's husband, a mining engineer by the name of Mitford; young Barton, a student at the University of Pennsylvania, home for the Easter holidays, and himself, sallied forth to the burning town to search for food supplies, heavy clothing and certain other things that might be required.

It was almost dawn before the first trip was completed. They were looters, in a sense, but it was not for the sake of plundering; it was a matter of life and death. Several times they encountered other bands in the blazing ruins who looked at their heaped-up possessions longingly, but the openly displayed revolvers and the determined faces of the men scared them off.

It took four fatiguing journeys before they had found enough to cover their wants in the gutted stores and smashed private houses. There was no law, no order; hardly any one alive.

It was almost high noon by the time the last bit of provisions was packed. Downer, who had been steadily figuring all through the night, eyes red-rimmed and feverish from lack of sleep, jumped suddenly upright, knocking over the improvised table, scattering papers right and left.

"If figures mean anything," he cried exultantly, "there is a chance."

Then he sobered abruptly. "But no one will be left on earth to survive. Even we—" he shrugged his shoulders wearily, and dropped into a chair, fast asleep.

Hartley snatched up the precious sheets, went through them feverishly. The calculations showed moonrise at 2:15 P. M., not two hours off. He read further. There would be no crash on this particular swing, but the doomful satellite would whirl past the mother orb a bare fifteen thousand miles away. Hartley shuddered and closed his eyes, trying to visualize what that meant to the world. Convulsions of an unimaginable nature! Then he shook his head resolutely. They could do no more than try. There was only two hours to go.

He drove the flagging, wearied people to renewed efforts; made sure that all supplies and equipment were safely on board, had Downer, still asleep, carried into the cabin. He looked at his watch. It said 1:42. Still approximately half an hour.

Young Barton, who had gone to the open doors of the hangar for a breath of air, shouted suddenly. There was alarm in his voice as he raced back to the plane.

"The moon! The moon! It's coming!"

Hartley ran for the door as hard as he could. A half hour early; that meant there was a flaw in the calculations. Then the subsequent steps might also be entirely wrong.

At the door, he saw a great body slide swiftly up the eastern horizon. One minute it was only a crescent resting on the hills, the next it was a huge, overshadowing, overpowering mass of jagged rock overwhelming the heavens, falling, falling swiftly.

Hartley turned and raced back.

"Into the plane! Into the plane!" he shouted as he ran, black despair in his heart.

(To be continued)

THE FATAL EQUATION

(Continued from page 837)

"Wait!" cried Funkhouser, starting forward.

"Get back!" growled one of the hard faced gunmen.

"Break up all of this—every bit," ordered MacMillan with a sweep of his arm that included all the machinery. "I'll be gone in a moment, but don't harm any of them—they're still my friends!"

Only two steps away from eternity, MacMillan's face glowed once again, and he advanced into the mysterious curtain. Sane man or mad man, he vanished in air before them. The humming of the coils and condensers rose momentarily and then dropped to normal again. If George heard a peculiar sound from the center of the space between floor and ceiling it was a sigh of contentment.

It was on the way back to the city that George broke the thoughtful silence.

"No matter how you look at it, Kip, there are two kinds of equations—mathematical and human. I think the latter is more fascinating: you never know who your unknowns are going to be."

THE END

THE MOON MINES

(Continued from Page 871)

Harrington spoke again. "Did you not tamper with Wood's oxygen supply so that he would be forced to go to Kranto after his trip of exploration?"

"I did not," Overseer Soderstrom answered sullenly.

"Did you not get a call from Pruma by your special radio connection," Soderstrom looked up in shocked surprise, "that Wood was there and that Pruma wanted your advice as to how to get the location of the new claim out of him?"

"Certainly not. Look here, Harrington . . . this is maddening! What in the name of truth are you . . . ?"

Harrington cut off the quavering voice of the shaking overseer. "Soderstrom, you are to answer my questions. Explanations will come later." Harvey Wood had noticed that as Harrington asked each question, he looked at Soderstrom, but when the latter answered, he kept his gaze riveted on something in his hand.

Harrington now arose, walked over to Soderstrom's desk and placed thereon a small disk-shaped box with a round lens in the middle of it. Soderstrom stared with worry written all over his face. Harvey Wood watched the S. I. S. agent intently.

"Soderstrom, and you, too, Wood, listen to this, I have here one of the Service's most important inventions. It is merely a lens activated by a certain principle of which I myself know nothing. However, it is useful to me in this way: it is sensitive to a person's thoughts and is capable of indicating when that person's thoughts are at variance with his spoken thoughts. In other words, if the person before whom it is placed speaks words of one train of thought, and at the same time has other hidden thoughts which do not correspond with what he says, this instrument tells me so. See that single lens? . . . if the person lies . . . it flashes red . . . if he speaks truth it is unexcited and remains blank. *This is an infallible lie detector!*" Soderstrom, at first trembling with terror, suddenly straightened up with confidence. Harvey Wood stared open-mouthed at the innocent little article.

Harrington again spoke. "I will not tell you how your other answers turned out, Soderstrom, but I am going to ask ONE MORE QUESTION while my lie-detector is on this desk."

Harvey Wood was sitting on the edge of his chair. Harrington motioned to him. "Come here, Wood, so you can see this yourself." The mineralogist came over and stood on the other side of the desk from Harrington. The eyes of all three men were fastened on that little disk, its single lens glaring balefully like an all-seeing eye.

"Now for the test, gentlemen," Harrington broke the tense silence. Suddenly he shot out, "Mr. Wood, are you or are you not responsible for the loss of three claims to Station No. 7?" As Harvey Wood leaped back like a frightened deer, Harrington whirled upon him with his gun. "Wood, come back here and answer my question . . . while the lie-detector weighs you words . . . "

Under the threat of the gun, the mineralogist returned and stood there shaking like a leaf. "ANSWER," thundered Harrington.

With eyes staring fascinated at the lens, the mineralogist said slowly, "I am not."

The lens flared red instantaneously. With a groan Harvey Wood sank to the floor.

Harrington was again in Soderstrom's office. It was the next day. He was about to leave the moon. He had accomplished his mission. He had broken up the cleverest frame-up he had ever encountered in his numerous commissions. He had been on the moon five days.

"Yes, Soderstrom, that's the sad part of it. The bigger of the two criminals, Pruma, will get the least punishment. Poor Harvey Wood will be the goat. Believe me, I'm going to do all in my power and that means the power of the S. I. S., to see that Pruma gets something I promised out of it, although, no doubt, most of his guilt will be snowed under by the political forces of the M. M. Sad state of affairs when a damned Ginzie can get away with all that Pruma did, and yet know that his government will make his punishment light. However, I'm sure he'll have to resign his position as overseer of a moon mine. Well . . . after all, Mr. Soderstrom, the claim-jumping is circumvented, and that, you know, was my commission . . . with diplomacy . . . " Harrington mused as to how much he had done could come under the heading of "diplomacy."

Soderstrom, relieved of the worry of the past few days, was once again the jovial, pleasant host. The events of the past months had burst about him like bombshells. Unharmed by the pieces, he had felt the concussions. His mind was made up to go back to earth to be fitted by the Bureau of Employment as some other cog in the vast machinery of the socialistic world.

"There's one thing I would like to know, Mr. Harrington, how long did suspicion rest on me?"

"Don't think hardly of me, Mr. Soderstrom, but you weren't free from suspicion till my second visit to Kranto. All along I thought it was a fool's game you were playing, if you were the guilty one, because of the careless way of filing applications so close to those that had been applied for by the Martians. I couldn't imagine an overseer being a fool, so I decided that somebody was playing a strategic game to get you out of the way so the claim-selling could go on uninterruptedly. I did not really suspect Harvey Wood till I first heard him talk. Then I knew I had the culprit. He was so eager to implicate you, he pointed right at himself."

Soderstrom reviewed the events of that last tense scene in his office. "That lie detector of yours, Mr. Harrington, is a remarkable instrument."

"Soderstrom, I'm going to test you with it right now." Harrington pulled it out and held it in the palm of one hand. "Mr. Soderstrom, can you keep a secret?"

"Yes, certainly." *The lens flared red!*

The overseer's face turned redder than the lens. He looked up at the other in confusion, partly mixed with anger.

"Please, Mr. Soderstrom, don't be angry," laughed Harrington as the other arose hastily. "You see, I kept one hand in my pocket. In there I have another little instrument with a button on it. When I press the button, the lens flashes red!"

THE END

THE DIMENSION TWISTER

BY HUGH KING HARRIS

● Here is a neat little scientific detective tale involving the sort of fakirs we all know about in our experience. Science must expect that unbalanced minds, absorbing unsuccessfully amazing scientific facts will turn them to crazy and absurd uses. Unfortunately some of the newer theories of Eddington, Jeans and Einstein, lead unscientific thinkers on to absurd conclusions, and often to devilish acts. This story is a case in point.

● Seated before a teakwood desk, smoking a long, slender cigar meditatively, Kent Forbs, B.S., M.C., Ph.L., in short the famous scientist, occultist, and sometime aide to Stan Wycks, astute crime investigator—reached out and lifted the receiver of the continental telephone before him.

His dark, deep-set eyes glowed with that curious fire flaring when his inner spirit of research was aroused. Only monosyllables, as he heard his friend Wycks sketch another mysterious disappearance, this time with direct reference to the weathered brick house on Achilles Square.

For a long moment his body remained tense; only the faint tick of a quaint brass clock on the mantel, beside a crystal globe, could be heard. Then his long, slender hand, the hand of an artist in surgery, drew forth a blue automatic. From another drawer Forbs took a blue, seal leather case, opening it under the red glow of the Byzantine lamp; there was revealed a miniature revolver, the butt a rubber bulb. Into this the scientist poured an ounce of clear, turquoise blue liquid; as he did so a subtle, penetrating odor wafted about the room. He worked quickly, holding his head well back to escape the fumes. Then this liquid gun was placed in the case and into his coat pocket.

Three strange, unsolved disappearances within four weeks! One partially solved, . . . this fourth victim, (for both Wycks and Forbs were convinced the missing parties were victims of some devilish, ingenious and clever master mind) . . . had been found floating in the Sound. Upon the breast of the man a purple Maltese cross!

Kent Forbs rose; tall, well-poised, and donned an outer coat; then he was swinging down the hall, and on out of the Regina apartments. His goal the house of mystery on Achilles Square.

He drove his own car, speeding swiftly to a point midblock on the square. Here he alighted to proceed directly to a paved alley which was a narrow cul-de-sac between the house he sought and a towering side-wall of a family hotel. His quick glance right and left assured him his presence in the alley was unnoticed. Ten paces down the alley he was not apt to be observed by passersby.

With utter confidence and with superb power he caught hold of the stone sill beneath a window, and drew his body upward. For a second, hanging by one arm, his left extended; with a satisfied sigh, he felt his shove on the window frame resulting in a slight, soundless movement. Cautiously, inch by inch the aperture widened, then his left knee planted against the brick, one heave of his body and he stood within a room, the window open behind him, and not a sound to convey his entry had been noted.

That Forbs was alone was accounted for by the fact Wycks was, at the moment, at the morgue examining the corpse of the man bearing that purple Maltese cross upon his breast. On a basement window in this house, Wycks in his intensive ferreting of every possible clue, had detected a cross upon the dirty pane. Rough, drawn by a finger in the accumulated dirt and dust. A silent, mute plea it had seemed to him, after that floating body had been dragged from the water's edge.

Wycks would arrive soon enough. While there was still daylight Forbs had decided with that cool nerve of his, to do some investigating on his own account. That Maltese cross intrigued him, as did the motive behind these disappearances. It might be occult, it might be simple silencing of witnesses to crime, . . . but Forbs had assured Wycks of skilled cooperation, which had been gladly accepted.

This room proved unfurnished, a row of shelves, a cupboard; rather an over-sized pantry. Only one door, closed, led to the right to what the scientist figured was the kitchen, to the rear of the house.

With cat-like tread he reached the closed door. Tense, head bent forward, Forbs became conscious of voices. The speakers were in the room beyond this door and any movement of the knob would be instantly noted. Yet oak panels were no barrier to the man of science. He glanced across the room, noted the electric light cord and in a moment had attached one end of a slender wire to the cord, in his hand a flat metallic disc with miniature rubber vacuum cup; then this was attached flat to a panel of the door. Forbs placing his right ear to the metal disc, grinned grimly. The words in the other room came low and distinct.

"So you come to me for help? It is well. Ungar never fails to control the mind, the spirit. So you confess yourself a coward?"

Like the dry rattle of bones that voice, Forbs shuddered; uncanny, an echo from the graves of Egytian dead, ages old, soulless.

"I am a coward, I want success, I crave glory, fame! Yet my very soul sickens in the time of crisis. Oh, I've

fought, . . . but I'm breaking I tell you!" a young voice, some man coming into this spider web of death, to call for mental aid. The voice went on earnestly, pleading. "You're one of these psychoanalyst sharks, or mental healers, whatever it is. Your advertisement said you could help me. Can you? Will you?"

A moment of silence, Forbs straining for the reply. A charlatan, a fakir duping an innocent victim. Pure, unadulterated humbug, . . . not worth bothering with, . . . yet there was the Maltese cross, the missing men and woman; the fourth, discovered dead.

"When these fears assail you, what form do they take? You have been an aviator, you have raced speed boats, you have taken risks not usually assumed by cowards?"

"That's just it!" cried the younger voice. "Fighting to win over myself. Crazy, daring stunt flying, racing, . . . gambling with death. Fear follows my dreams. Hellish, infernal living dreams that stay with me for days. I dream of wild mountains, caves and gigantic beasts, back to the Paleolithic age, and ugly crawling monsters, green-eyed, pursuing me. Men tall as oaks brandishing great limbs of trees shrieking, battling in bloody conflict as I seek a cave, cowering in the cold dark, naked; then I awaken, sweating, shaking, . . . my nerves shattered. Fear, dirty, yellow fear eating my heart out."

● Forbs eyes narowed, pupils mere pin points, he was scarce breathing. The one who called himself Ungar, . . . could he analyze these dreams? Had he knowledge of the truth?

If Ungar were faking, his answer would prove it, for Forbs well knew that these dreams were proof of his own convictions as to previous existence. The life that was, and which comes back to man's mind vaguely, in the form called dreams. Imagination; but Ungar was talking:

"Once, you were living as you dream. Don't smile, Quayle; it is the fact, cold fact. The soul, or subconscious mind, as it leaves one body to inhabit another, retains some of its past experiences. Know this, Quayle, matter is made of atoms and electrons, also that the electrons revolve in diminutive orbits at amazing speeds; know, too, that some so-called matter contains infinitely more electrons and atoms per molecule than others. I have listened to the sound of these electrons as they revolve, with mad rapidity. I have counted them. But I have not gone far enough, there is still more to know, . . . more that rests within the *human brain*."

Forbs sucked in his breath, his right hand sought the gun gressing his side. Ungar had revealed an amazingly impertinent claim to knowledge of science which was all wild . . . something of the truth as to what had transpired in this mystery house was dawning upon the scientist. Shadows were deepening, Wycks might put in an appearance at any moment, . . . a contingency Forbs hoped would be delayed. Beyond this door was about to be enacted a drama beyond the flights of imagination, and eagerly Forbs awaited developments.

"Atoms, molecules, electrons, rather Greek to me, professor, or doctor, whatever you are. How does all of this affect me?" queried the man named as Quayle, a name hauntingly familiar to the man listening at the door.

"You come to me for aid, I can help you. You have intelligence, I had thought you possessed great courage. Yet now I know your background,—I can see that courage can only come to you, if you return to that prehistoric life. Fight battles *there*, overcome forces of evil, kill beasts and emerge again today; victorious, confident, with fear and cowardice dispelled."

There was the sudden movement of a chair, the sound of moving feet as though the younger man had leaped to his feet. His voice came high pitched, incredulous. "That is sheer, damn nonsense, man!"

"Sit down!" Like a dash of ice water came the command. "I do not juggle with untruths! I know the inner mysteries of past, present, and I shall attain to the *future*." A hideous, unsettled laugh wailed through the door. Forbs shuddered. This Ungar was mad, not a living doubt; but a scholar, a scientist who tried to master mysteries far beyond Forbs himself.

"You have come to me, of your own free will. You seek my aid, . . . I have need of your willingness to cooperate," the bone dry voice was softer, sanity had returned; or was it the crafty, subtle cajoling of sinister purpose? Masking some grotesque fantasy of un-named horror?

"You can sit in that chair, at ease. I will project you into the fourth dimension, in that dimension time, space, *self* counts as nothing. While your body remains here, your sub-conscious astral will soar back over the years, the centuries, . . . back to pre-historic times. But if you are afraid, . . . if this cowardice consumes your mind, if you shrink, or rebel it will be difficult.

"Note that the chair in which you sit has straps, a headrest. That your fear for the moment may not prove disastrous, I will secure you firmly, . . . there is no danger, . . . "the voice cracked high and cold, another cackle, "fear, . . . danger! That is what you have come to me to overcome. Listen Quayle. It will be a great adventure, thrills,—beyond your flying stunts, your mad speed boats, your roar of motors. The fourth dimension is a strange reality of nature revealed to few who have the faculty of intuition. Dimension derived from the Latin. *Dimensio*, ... meaning to measure, then follows aspect, form, and direction.

"You and others recognize, or figure upon three known dimensions, . . . length, width, height. Some men aspire to knowledge of fourth, fifth, even sixth dimensions. Dimension may be termed beyond our puny knowledge, as soul existence. People living in and out of our own bodies, not physical but creatures unseen, unfelt, . . . other dimensions."

Forbs shifted his weight uneasily. Wycks was due. If Ungar were basing his elucidations to Quayle upon straight, honest effort to educate the man as to scientific attributes of time and space, . . . well and good. But Ungar was leading plainly to a suggested hypnosis, Forbs also knew that no necessity required the strapping of the subject in a chair. No binding, or physical restrictions, such as were to be imposed.

Another victim of the Maltese Cross?

Like a meteor across his brain flashed the thought. Behind all of this ritual of Ungar lay some sinister portent, a reflex of a scholar daring into realms barred and bordering on the criminal. Then Forbs swung swiftly, his gun levelled at the window.

Someone had placed hands upon the sill. A scraping sound, a body coming up into this room! Cursing the interruption, Forbs quickly pocketed the automatic and produced the gas gun. Any shot now would betray his presence to Ungar, foil any attempt to secure final solu-

tion of this bizarre mystery. Facing the window Forbs cooly prepared to launch a stream of the stupefying liquid into the face soon to be framed over the sill. Then his muscles and nerves relaxed; that lean, virile face, that pair of eyes belonged to Wycks, who was about to call out, when Forbs gestured for silence.

● Like a cat, Wycks dropped across the sill. Silently he bent his head so the scientist could breath into his ear. "Hell's popping in that room; my own dictagraph, I've listened in. We can't both hear, but stand by,—a break may come any instant. Don't interrupt."

Wycks, subduing his evident curiosity, nodded as Forbs resumed his listening attitude, ear pressed to that delicate instrument of sound. Only a few moments had elapsed, . . . what had transpired, or been said in the interim in the other room, the scientist could not know. For a moment he stood quiet, a puzzled frown puckering his forehead. The voices beyond the panel had ceased.

"No!" it was Quayle shouting vehemently. "I'll not do it. Maybe I *am* a dirty, yellow coward, but if my body does stay here, if my mind goes flying out into the unknown, how do I know I'll come back? My soul; that means my life. I'm not up to it, Ungar. Keep away from me. I won't, . . . back I say . . . oh—"

A muffled groan, utter agony, then one bone-rattle laugh, mirthless, soul shivering. Wyck's took a step forward; that groan, and the dull, heavy thud of a falling body had carried even to his ears.

"Good Lord! Forbs, we've got to get in there," Wycks muttered.

"I was afraid the young fool would fall victim to Ungar. But quiet, Ungar hasn't killed his man yet, . . . I'm sure of that. This is a brain test, and my idea's to see what's going on in there. Ungar will be too busy to notice our entry through the basement. Get out of that window, Wycks, hurry. We have a slight margin of time, all too slight, perhaps."

Forbs' decisive manner aped Wycks to action. In another minute the men were down in the alley, with heavy shadows about them. The sun had dropped out of sight, yet Forbs had asked no questions as to the investigator's trip to the morgue. That could wait. With common assent and unity they darted to a basement window, directly under the room in which Quayle and Ungar had been conversing. Black smudge and bits of coal marked this as the furnace room window. When the window was pried open they edged themselves in to land on a pile of soft coal. Despite precautions the coal slid about under their feet, there was more noise than either desired, yet when they reached the clear floor, no indication came that their entry was detected.

"Ugh! What a stench," muttered Wycks, his body a ghostly shadow in the gloom. Sickening, fetid, . . . an odor of decayed flesh. A cold blast of air swept sickeningly across Forbs' face. Objects loomed from the corners, fantastic shapes, while a sudden tapping came from above their heads.

"This is a beastly hole, we've got to find the stairs, come on, Wycks. Dark as a dungeon, how about a pocket lamp, I didn't bring one?"

"Righto," then the ribbon of yellow ate across the floor.

"Great Heavens! Look, that's blood; yonder an open pit. Flash your light over this way. Merciful father! . . . Wycks. What a sight! Come on, I'm getting dizzy."

Forbs was pivoting for the stairs in the corner as Wycks held one horrified second, staring down into the horrible pit.

The stench almost overpowering him. Ghoulish faces, whether man or woman, half covered with a filthy scum stared up at him, flesh corroded, falling from bones by action of the acid, the pickling liquid of the pit.

"There's an answer to where some of the victims disappeared," snapped Wycks savagely.

Forbs, at the foot of the dark wooden stairs, halted abruptly. The cellar was humming, about his ears was a drone as of gigantic bees. Wycks flashed his light about, darting rays up among festoons of cobwebs, then across that pit of death. Still the amazing sound engulfed them, zipping, spitting sounds, the smell of sulphur.

Shouting above the strange noise, Forbs went up the stairs on the jump, Wycks at his heels. A cellar of ominous portent, gloomy, evil smelling, to haunt their every dream.

"Come on." Forbs kicked open the door, found himself in a narrow areaway and swung to the right. Unerringly he had located the kitchen, but when he flung his body against the oaken barrier, it refused to yield. Together Wycks and Forbs stood back then plummeted bodily; at the impact of their shoulders the bolt snapped.

From within the room rang a wild cry. Like a trapped tiger, beside a huge wooden chair, in which was bound a helpless form, crouched Ungar, swarthy, hatchet face contorted into a murderous, maniac snarl.

"Get out . . . who are you? Get out, I say!"

Forbs ducked as a great crystal jar sailed directly at his head. Wycks, uttering a cry of warning drew his revolver; the mad scientist had reached for a repeating rifle resting in the corner. It was Forbs who launched out to dive under the weapon; a terrific uppercut landing on Ungar's chin. With a grunt the man went backward, sagged and toppled to the floor.

"Quick, for Heaven's sake, Wycks! There by your arm. That switch,—good!" as the investigator yanked down the black lever. The vibrant hum that had assailed their ears died out.

"Here, help me unstrap Quayle. He's breathing, thank God," said Forbs. The man lay back a choking leather thong about his neck, both wrists were encircled with copper bands, his ankles stripped of shoes and socks—as had been the body of the drowned man in the Sound—were similarly encased.

Running from the center of the chair, in the back, a pair of heavy, insulated cables connected with a square black box upon the wall. An ebony lever protruded from the upper section of this box. Upon Quayle's head, which had been shaved to the skull, rested a cap, formed of grayish metal composition, unknown to Forbs. Across this cap, where it met Quayle's forehead was a long, numbered strip of brass, much like the scale upon a radio; a red arrow indicating the scale numerals.

"This hellish contraption looks to me like the electric chair, at the big house," muttered Wycks, wonderingly.

"I have not quite fathomed the matter," retorted Forbs, studying the wire connections with interest. "Although I have a rather clear conception as to what lies behind the entire mystery. Ungar might fly off at *any* tangent. I venture an examination of the bodies in the death pit, will reveal each victim with a shaved cranium. This man Ungar was ranting about the fourth dimension, a long

dead past, and a positive future life, of souls, and thought transference. Quayle came here to find a method of conquering cowardice. I should say if this experience has not frightened the very life and soul out of the man, he need never worry about cowardice again."

"Quayle?" repeated Wycks slowly; his nod came emphatic. "Now I know; he is Hy Quayle, dare devil racer, speed boats, autos, airships, . . . I've seen his picture in the tabloids often. A coward? I'd never have thought it. But here's another mystery, Forbs. The man in the morgue has a shaved skull, his ankles and wrists burned black. I wondered at those strange, charred circles."

Forbs nodded silently, busy endeavoring to force a drink between Quayle's ashen lips, but the eyelids never fluttered, the lips remained a tight, unyielding line. The scientist rose, a grim twist to his lips, then he reversed the electrodes, manipulated the switch and to Wycks' wondering amazement, Quayle jerked to instant consciousness. Utterly dazed, shaking his head, his eyes focussed upon Ungar crumpled in the corner. His face contorted to black hate.

"Curse you, you beast! Just a murdering fakir, . . . the prehistoric age, me going back through the centuries to conquer my fears, to drive away my dreams. Bah! You wanted to steal my brain, my stunt courage,—to use it for yourself. You tried to transfer my mind to *yours*, . . . but it didn't work!"

"Calm yourself, Quayle. You have hit upon much of the truth, but would you mind explaining matters? Exactly what transpired in here? I know he strapped you in the chair, upon your refusal to continue the experiments. I know he clugged you, but please make the whole affair more definite," Forbs spoke quietly, facing Quayle.

"You know what went on in here?" Quayle betrayed his astonishment. "The rat claimed we were alone in the house. He had to land on me with a mallet to strap me in this blasted trap. He said he intended to explore my brain, turn my talents into his own mind. Ungar, the fakir. He is a lunatic, isn't he?"

"Undoubtedly," replied Forbs seriously. "At one time a keen student, a scholar, a dreamer perhaps, delving into the realm of atoms, molecules,, dimensions—striving to achieve the greater dimensions of the mind in a world beyond. In his explorations into the realm of mind, his own brain snapped. Grim tragedy, but the truth. You spoke of some advertisement. What was that?"

"I noted a small card in the *Times*, a blind address. Like a fool, I answered it. It offered mental science as cure for nerves, for fear. Of late I've had horrible dreams, broken sleep and my nerves were shot. But it does not come from any former life; I'm sold on that. A regular doctor looking after my liver is what I need, not a cracked brain specialist."

Forbs and the investigator smiled. Quayle returning to his usual self, and stating an obvious fact. Wycks having learned Quayle's story, turned to tracing back on facts applying to the other victims of Ungar. Summoning the coroner he assigned to him the unpleasant duty of handling the semi-destroyed bodies in the death pit. Here the coroner made a startling, gruesome discovery. The vat of quick lime failed as a solvent, as it had not been properly slacked, the bodies were but half consumed. Ungar in his unbalanced state of mind, had failed to take into account a drain pipe that discharged into the pit, thoroughly diluting the contents. So diluted the bodies were in a most horrible condition.

Forbs, upon investigating, after a thorough fumigation of the cellar, found two large dynamos beneath the cellar stairs, these had created the strange hum, as Ungar had switched on the current as they were about to ascend to the kitchen.

That same evening Wycks faced Forbs in the latter's apartment. "What's your idea as to the Maltese Cross on the breast of each victim?"

"That?" Forbs smoked thoughtfully for a moment. "I happen to know Ungar belonged to several foreign medical and scientific societies. The Maltese Cross is an honor emblem for one of the foremost, highly thought of societies in Munich. My deduction is that Ungar had won this cross honorably, before his mind turned to murder. In his insane orgy of thought and brain transference, he stamped each of his victims as an emblem of honor, that is, he heated the medal, and branded the body to mark a martyr in the cause of science."

Wycks nodded. "I understand; but when down in that cellar I investigated a bit. The window upon which he had traced the cross was but a few feet from the death pit. Ungar had traced that cross in the grime on the glass, after dropping a victim in the pit. Stamped in his brain, as upon the body, it was actual thought transference, subconscious, true, but leading us to a timely solution of a very baffling case. A queer twist of Justice, at that."

THE END

In the Winter 1933 Wonder Stories Quarterly

"INTERPLANETARY BRIDGES" by Ludwig Anton.

Here is the most important interplanetary full book length novel that has appeared for a decade in Germany. WONDER STORIES QUARTERLY has acquired the rights for this classic, and we are certain that the story will make science fiction history.

The author, who has a number of novels to his credit, is a well-known German amateur scientist, and in no instance does he exceed the bounds of plausibility throughout the story.

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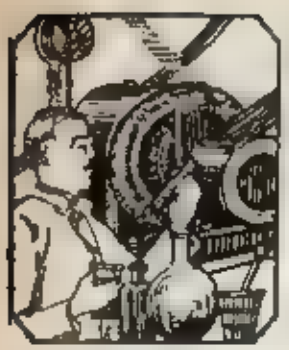


Science Questions and Answers

This department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited we cannot undertake to answer more than three questions for each letter.

The flood of correspondence received makes it impractical also, to print answers as soon as we receive questions. However, questions of general interest will receive careful attention.

The Law of Inverse Squares

Editor Science Questions & Answers:

I have read several different explanations of the Law of Inverse Squares. Could you explain which is the correct one?

Aidan Boyack,
32, Palmerston Road, London, England.

(The Law of Inverse Squares finds its special application in the change in intensity of radiant energy of various kinds at different distances from the source. This means not only the radiations from hot bodies—such as heat, light, radio, cosmic and other rays of the electromagnetic spectrum—but also radiations that we call gravitation.

The Law of Inverse Squares states in general that the effectiveness of the radiation decreases as the square of the distance from the source. In other words let the amount of radiation (of any kind) at a distance Y be called X. If we move twice as far away from the source (being now at a distance 2Y) the amount of radiation at any point becomes decreased by the square of the distance. Since the distance is twice as far away and the square of 2 is 4, the radiation is only ¼ as intense. If the distance away is 3 times as great the intensity of radiation is 1/9; at 10 times away it is 1 100th.

For example, we have a searchlight and 10 feet away the intensity of light at any point is 1000 candlepower. If we move 20 feet (or twice as far) away the intensity is only ¼ as great, ¼ of 1000 being 250 candlepower. If we move closer to 5 feet (twice as close) the intensity is 4 times as great or 4000 candlepower.

Similarly in gravitational radiation. On the surface of the earth (4000 miles from its center) a man weighs 100 pounds. If he goes twice as far away from the earth's center, to 4000 miles above the surface, the intensity of gravitational attraction is ¼th of that at the earth's surface and he weighs only 40 pounds. If he goes ten times as far away, to 36,000 miles above the earth, or 40,000 miles from the earth's center, his weight will be only 1/100 as great as at the surface and he will weigh 1.00 pounds.

For those mathematically minded the equation of the law of inverse squares might be stated thus:

If X is the intensity of radiation at a distance Y from the source and X_1 is the intensity at distance Z then

$$X_1 = X \frac{Y^2}{Z^2}$$

—Editor.)

Moon Tide Effects

Editor Science Questions & Answers:

I would like to ask a question concerning the effect of varying numbers of moons on the tides of a planet. Assuming the existence of fairly large bodies of water, what would be the effect, for example, on Mars with two moons and on Venus without any? Also what effect would the sun have on the tides of Venus? In one of your stories the author spoke of breaking surf on Venus, which was what called the question to my mind.

D. E. Dixon,
New York.

(As regards the influence of a plurality of moons on the tides of a planet, they would tend to strengthen each other when in line, and neutralize each other when at right angles; just as the sun and the moon do with the tides of the earth. The more moons, the more complicated the effect would be.

The factors entering into the tides are the respective masses and distances of the planet and its satellites, the period of rotation of the planet, and the angle which it subtends (that is, its apparent size as seen) from the satellite. The last is more decisive than the apparent size of the satellite from the planet. If the satellites of Jupiter were as large in proportion to Jupiter as our moon is to the earth (that is, several hundred times as large as they are) the tides of Jupiter would be almost unimaginably large.

So far as we can judge, no other planet has oceans (of water at least) unless it be Venus. If Venus has oceans like our own, tides like our own would be raised by the sun, whose influence on an interior planet is greater; but even in tideless lakes, the wind may cause a violent surf. If Venus rotates only in twenty days, or 228 days, the tides would rise and fall more slowly—twice in each rotation—but with a greater range.

The ultimate result of tidal action, astronomers calculate, is to bring the periods of rotation and orbital revolution of a satellite to coincide, when the tide ceases, since the satellite will always present the same face to its primary.

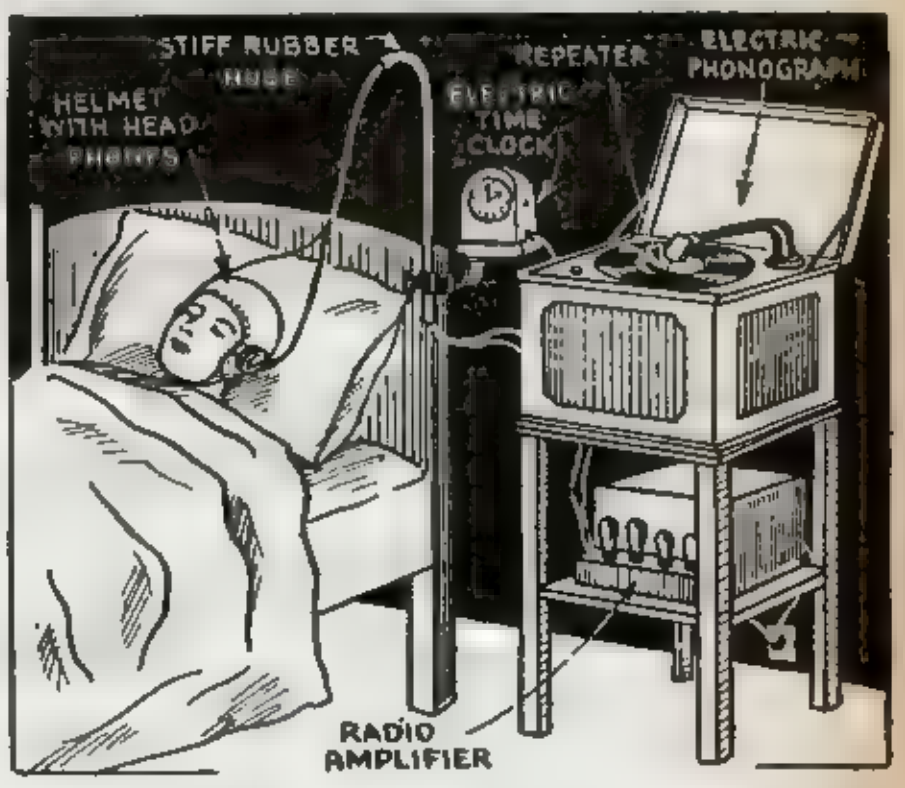
Learning While Asleep

Editor Science Questions & Answers:

Would you please give a description of the machine invented by Mr. Gernsback for teaching while asleep by means of controlled "dreams"? I believe this is used by the Naval Training Station at Pensacola, Florida.

Charles Davis,
Bremerton, Wash.

(The instrument referred to is called the Hypnobioscope. It does not teach by controlled dreams, but rather by having the "lessons" spoken into the sleeper's ears, the theory being then, in this case, an infinitesimal moment during which the shell is just about to emerge from the gun, during which its velocities just balance. Theoretically the shell might just perch at the tip of the muzzle. However, in either event, the principle is the same. The shell would certainly have no velocity with reference to the ground.—Editor.)



The apparatus here is the Gernsback "Hypnobioscope." It consists of an electric phonograph, a radio amplifier, a repeater, an electric clock and a helmet with headphones.

Would the Shell Leave the Gun?

Editor Science Questions & Answers:

In your March issue you have the problem of the cannon on a train. You say the bullet would drop to the ground if the train were traveling at 60 miles per hour and the bullet's initial velocity was 60 m. p. h. There is some doubt in my mind as to whether the bullet would actually leave the gun at all.

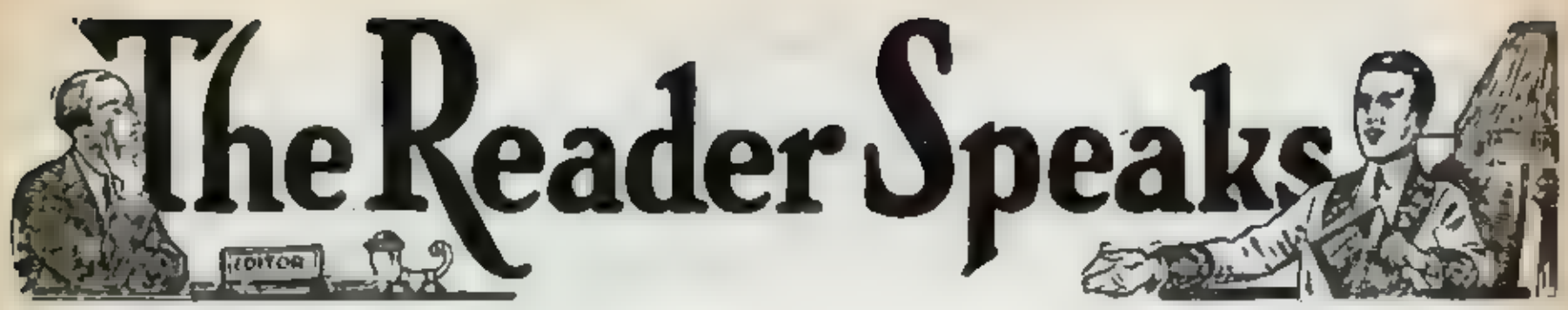
Harry Boosel,
Chicago, Ill.

(Mr. Boosel may be right. What we wanted to point out in the problem of a train moving in one direction at 60 miles an hour and a gun on the train firing a shell at 60 miles an hour in the other direction, was that the shell would have no motion with reference to the ground. Its muzzle velocity is neutralized by the motion of the train. Mr. Boosel should remember, however, that the velocity of the shell we speak of is its muzzle velocity. That is, the explosive that sends the shell on its way continues to expand in the barrel of the gun, accelerating the velocity of the shell until it reaches the muzzle. There is that while asleep his subconscious is most open to the reception of the information.

The apparatus consists of nothing more or less than an electric phonograph with an ordinary record of any subject—lecture, music, etc. —which is rotated continuously by means well known, and the record is automatically played over and over as long as is desired. By means of a clock (known as a radio clock, now on the market) the phonograph can be set in operation at any pre-arranged time. The clock can be set so that the phonograph starts operating, let us say, at 2 a. m. in the morning and keeps on until 3 a. m. or any other time selected. The subject uses a so-called aviator's helmet with a pair of earphones which is attached to a magnetic pickup or phonograph pickup. This headgear is preferable because it is not likely to get out of place when the sleeper turns around in his sleep and changes position.

It is necessary for the subject to wear the apparatus for several nights without any attempts to operate it, so that he can become accustomed to the headgear. The first two nights

(Continued on page 896)



IN THIS department we shall publish every month your opinions. After all, this is your magazine and it is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good old-fashioned brick bat. All are equally welcome. All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 25c in stamps to cover time and postage is remitted.

The Smell of Hydrogen Sulphide

Editor, WONDER STORIES:

From one of your replies to readers you invite comments on the kind of stories that should be run.

1. They must be readable, that is, written in an interesting way.

2. A good plot without "miraculous" coincidences.

3. A moral and educational lesson.

4. A story must "register"; it must have something that can be followed and understood. For example, a description of the fourth dimension as a measurement of length is pure gibberish.

5. I do not like to smell hydrogen sulphide (H_2S); it is revolting, neither do I like the creation of super-skunks, villians who are foul, loathsome and leperous (mental cesspools).

The type of story in which a white corpuscle or cell is supposed to have intelligence and tells its life story would be welcome. I appreciate your magazine and would suggest that where an author embodies demonstrated facts or a working hypothesis that is in harmony with real scientific investigation in a fictitious romance the "fact" should be enclosed in brackets.

Some of the authors are so convincing that one thinks of getting a ticket for a ride in a space ship. To save us from the belief in interesting nonsense the "facts" in stories should be labelled.

W. Hodgkinson,
73 Mona Road, Notts., England.

(It is hard to protect our English reader against the "convincingness" of our authors. They do make things seem real. We are really stumped in advising him what to do about it. We could of course tell our authors, "make your stories less realistic, don't make them so convincing." But I think we would have to hide from the deluge of brickbats that would fly our way. In the meantime, while we are working out that knotty problem, we refer our authors to Mr. Hodgkinson's requirements for stories; we second them.—*Editor.*)

Cyanide Did Not Kill

Editor, WONDER STORIES:

I have been very well satisfied with your stories and the improvements but wish to ask you about a story in the January, 1933 issue.

In the "Synthetic Entity" Erasmus van Hooten injects cyanide into the growing mass. This does not affect the plant in any way. His next idea is to feed the plant to the fish. It does not affect the fish in any way, even though it does contain cyanide. Why does it not kill the fish?

Joe H. Hunsigar,
East Tawas, Mich.

(Apparently the Entity had the ability to absorb the cyanide and even possibly use it as food. That was, we believe, the point that Capt. Meek tried to make. Every thing was grist to the mill of the Entity. By the time the Entity was thrown to the mercy of the fish it had already absorbed the cyanide into its tissue and rendered it harmless.—*Editor.*)

In Telepathic Communication

Editor, WONDER STORIES:

I am sure there is such a thing as mental telepathy; and I am almost certain that I have experienced it. It seems that every time I get a great idea for a story or an invention, someone else comes out with it. Or maybe it's the other way around. When someone else thinks of a new plot or an invention I think of it also. I believe I could have come out with some of them myself.

I know I couldn't stand up for a minute in one of the regular mental telepathy tests but I can receive messages, as far as I have said. My first experience came when I thought of a new field of science to write about. This was before I knew that the atom was made of particles of electricity. I thought that the atom was just like a solar system, and that people could live on it. Then someone could invent something that would make one smaller or larger so that one could go out of the atom. A few weeks later I read of a story of life within an atom of gold.

Then I thought we could reverse the situation and have us as merely atoms of another world. Then if we were made larger we would reach that world. Several months later I read a story of *that* kind.

There have been other cases of a similar nature. One concerned a way for generating electricity by photoelectric cells. A solar generator plant is now being made using that method. So you see there must be something to it.

Now for a few suggestions:

1. Cease the 15c size and go back to 25c.

2. Give us one of each kind of story in each issue.

3. Give us some new plots.

4. Let's have some more humor in the stories, and last but not least, let's have a department reviewing science fiction pictures.

Milton Rothman,
Philadelphia, Pa.

(As Mr. Rothman sees, we have anticipated him by going back to the 25c size, with stories of each kind in this issue.

With regard to his telepathic experiences we don't know what to advise. Apparently if he keeps on he will ultimately get a head start on the others who are in telepathic communication with him, and get his idea to the world first.—*Editor.*)

Man and Mechanism

Editor, WONDER STORIES:

A certain reader of WONDER STORIES, namely, George R. Kirkpatrick, is obviously an atheist or an agnostic. The statements he made in the March issue are the reasons for this letter. In this letter I shall try to untangle his confused reasoning.

Let us suppose that here on the right we have an animated intelligence, MAN; and on the left we have an inanimate object—a delicate and intricate mechanism. Is it easier or more logical to believe that the intricate mechanism "just was" or that it was created by the intelligence, Man? The answer is quite obvious. Such a mechanism could not have "just happened." It must have been designed. Eh?

All X.

Now substitute for the infinitesimal intelligence, Man, an infinite intelligence—God; and for the minute mechanism the Great Universe. The same reasoning applies. Its creation must have been guided by a vast intelligence. And, another important factor is that the little mechanism must be cared for or else it will not run very long. Now, if that tiny thing needs caring for—why—what of that huge mechanism—the Universe?

A study of the emotions and characteristics of man reveals a spiritual nature. From the beginning he has worshiped a god of some sort. What a disappointment to the men of the many past millenia if in death they have found that there is no omnipotent being—a God!

However, a person may study a lifetime through all the physical sciences, but, when he dies of old age he will not have proven or even found that there is or is not a God. For intelligence is intangible.

I have not been able to comprehend how a person can study a beautiful flower or watch a colorful sunset dim into lovely purple twilight, with its myriad sparkling diamond-like stars, and not FEEL the presence of GOD.

What abysmal darkness a man's life must be who has no hope of a life hereafter. Especially one whose entire life has been made a living Hell by either a financial or physical affliction! His life must be aimless and lacking all love, a sense of beauty, or ambition to be virtuous since he knows of no promise of a reward for his goodness. What a horrible world this would be if everyone were like that!

It is not for me to say that man will never create life or that any undertaking is absolutely impossible. But, to my way of thinking, life is the ultimate creation and I believe that life is one secret man will never discover. Now, by that, I don't mean that man will not learn to make flesh or tissue (by using living cells as a base on which to build)—but if and when he does he will not understand it. It'll be like a radio—man made it, yet does not understand it.

As a science fiction enthusiast, I anticipate synthetic human organs. I sincerely believe that surgeons of the not-distant future will possess the power and knowledge to graft a living leg, arm or heart to a human being and that being will recover and be normal.

The statements I have made were not intended for any disrespect for Mr. Kirkpatrick but to enlighten him, if possible.

Clay Ferguson, Jr.,
Roanoke, Va.

(Here is a carefully thought out, well-worded argument on the God question, that merits the attention of our readers. While we take no part in the discussion, we might whisper that analogies can often be carried too far.—*Editor.*)

ON LETTERS

BECAUSE of the large number of letters we receive, we find it physically impossible to print them all in full. May we request our correspondents, therefore, to make their letters as brief and to the point as they can, as this will aid in their selection for publication? Whenever possible, we will print the letter in full; but in some cases, when lack of space prohibits publishing the complete letter, we will give a resume of it in a single paragraph.

Have We the Nerve to Print This?

Editor, WONDER STORIES:

Mr. Miller writes in the March issue: "What has happened to the science fiction writers? To me it seems that they are slacking more and more . . ."

At last it has come out! Something has happened to science fiction. And I think I know

THE READER SPEAKS

(Continued from page 891)

what it is.

Lately you have been giving us stories by authors who don't know a darn thing about writing (There are exceptions of course.) This is a tough season; we all know that. But, readers, do you know how it's affected the science fiction market—as well as all other fiction markets? The magazines aren't making money; agreed upon by all of us. Naturally, the editors seek to secure stories at the lowest rate possible. So what happens?

A good author (who demands a high rate for his stories, and deserves it because of the fine stories he's written in the past) sends in a top-notch story. In the same mail comes a poor story, but manages to be coherent, from a newcomer, a youngster, usually, who'd give anything to see his story in print. The editor, or maybe the publisher, figures it's more economical to fill up the pages with material which they can secure for an infinitesimal price, than to pay the good author, with his good story, a good rate.

I hate to admit it, but I feel that WONDER STORIES is following this policy. I'd rather not see a science fiction magazine on the market if it's continually going to give us the paltry, puerile and putrid stuff that it is publishing today. It is as Mr. Miller so capably puts it, "Wholesale trash,"—and as you so unconsciously add "and then some."

Where are your ace-authors of former years: Dr. David H. Keller, Harl Vincent, Bob Olsen, Miles J. Breuer, Gawain Edwards and some of the others?

So my earnest and sincere plea is this: discontinue WONDER STORIES if you intend to keep giving us the worthless stories as those of the past few months, and when good old prosperity returns revive a new and better WONDER STORIES like the issues of 1928-1930. Then science fiction will be worth reading about, worth talking about, and worth thinking about. Your present stories are printed with mud. What do you intend to do about it?

Have you the nerve to print this?

Julius Schwartz,
New York. *Editor.)*

(We wonder, really wonder, why our young readers throw a letter such as this at us and then yell, "Have you the nerve to print this?" We thought our readers realized by this time that from the sneering, insulting, and bombastic letters we have already printed that we don't shrivel up at an attack such as Mr. Schwartz lets fly.

Mr. Schwartz, despite his telepathic knowledge of the editorial mind, errs in quite a few respects. As a matter of fact we are paying more for our editorial contributions than we paid in the "issues of 1929-1930." How do you explain that, Mr. Schwartz? Furthermore, we have been offered stories by many so-called top-notchers, and we have turned them down because we did not think that our readers wanted "merely a name." Too often men with "reputations" begin trading on their names, believing they can turn out millions of words of all kinds of drivel. Names do not interest us if there is not a good story behind them.

Mr. Schwartz misses the whole point of the discussion of Mr. Miller. Mr. Miller bemoans the fact that most of our present day authors—good, bad and indifferent—have run out of stories or ideas, and resort to trash. If that is true, what is to be done? Certainly the thing to do is to help develop the younger men who have talent and originality. Do you object to that, Mr. Schwartz? The rate we pay a new writer is very little different from that which we pay an old experienced hand. There is no financial benefit to us in this; but we do feel that if we give new writers the benefit of our experience, encourage them, "play ball with them," they will be the Burroughses, the Vernes, the Merritts of tomorrow.

There are times when even editorial patience gets out of hand. This is such a time. The editor knows he should be a model of sweetness in the face of criticism, he should smile patiently, but once in a while . . . . . well enough.—*Editor.)*

More From Sharp

Editor, WONDER STORIES

Mr. D. D. Sharp's story in your issue for February, 1933, "At Bay In The Void," is one of the best stories of that character I have read in a long time. It contains all of the elements of a good story, and it is excellently handled.

I don't think you would make any mistake with your reading public to publish more of Mr. Sharp's stories.

Yours very truly,
Fred G. Benton, Attorney-at-law,
New Orleans, La

(We echo this.—*Editor.)*

A Doubt Arose

Editor, WONDER STORIES

That old question of science versus religion is being raised again, after seemingly being buried so many years. Well . . . . .

If the atheistical Mr. Kirkpatrick, who voiced his opinions in the latest issue, were to inquire of our leading scientists—Millikan, Compton, Einstein, Jeans, Eddington—as to their religious views, he would undoubtedly be surprised to find that they are all decidedly not atheists, nor even agnostics.

Early in my quest after knowledge I came upon the principle of the conservation of energy. Immediately the outstanding fault of deism and all religion became apparent. How, I wondered, could any being, even if all-powerful, create something out of nothing? Hence the universe could not have been created by any supreme being. And so in this first stage I denied the existence of a God. It is in this stage that Mr. Kirkpatrick appears to be.

But soon a doubt arose. Certainly the universe could not have created itself or have developed automatically out of nothingness. But the atheists' only explanation of how this universe came to be was that it developed from nothing, a claim that also violated the principle of the conservation of energy. Thus I passed into the second stage, the stage of agnosticism.

(Continued on page 893)

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The Quarterly Contains

"Interplanetary Bridges"

By Ludwig Anton

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THE READER SPEAKS

(Continued from page 892)

But further study, bringing me it did some slight realization of the wonderful majesty of the heavens, of the amazing phenomena connected with the infinitely large and the infinitely small, and of the mystery of life and death, led me into the third stage, the stage of wondering whether these cosmic phenomena and the mysterious thing called life were not after all the work of a Creator. It seems to me that when one begins to know something of the rigid, delicately balanced working of the universe, of the intricate machinery of the cosmos, one must hesitate before denying the existence of a God for it becomes increasingly apparent that this wonderful universe of ours can be the work of no one but a supreme being.

Compton, the University of Chicago physicist, definitely believes in a God, for, says he, only an all-powerful being could have established a universe such as this. It is inconceivable for it to have created itself. And most of the modern scientists agree with him more or less.

I would advise Mr. Kirkpatrick to delve a little deeper into Nature's store of secrets and if what his study reveals does not cause him to realize that there must be some sort of supreme being, nothing will.

Life—that mystery of mysteries—how could it possibly have just come about of itself?

One of your correspondents urges you to enlarge the "Reader Speaks" department and this I heartily second. By all means let us have more columns of letters even at the expense of the fiction, for the letters are more interesting than most of the stories. And keep the book reviews as they have been in the past. If possible let us have a larger number of reviews each month.

And *please, DON'T* defile your pages with Technocracy.

Milton Kaletsky,
New York.

(Well, let us sit back now. The eternal battle between science and religion—God or no God—begins anew. Not that we are against such discussion. We are for it, wholeheartedly. All discussion intelligently carried on is worthwhile. So, on with the battle.—*Editor.*)

God—An Electromagnetic Force

Editor, WONDER STORIES:

Before I start my theory of God and the universe I want to praise your wonderful magazine. WONDER STORIES is to fiction what EVERYDAY SCIENCE AND MECHANICS is to the non-fiction student of science.

The only way I can answer the God discussion is to do a lot of assuming; however, I will try to base my ideas on science.

I am not religious nor am I an atheist. My theory backed up by many scientific facts is that there is another force or power related to energy. For want of a better name let me call it creative energy; or if the religiously minded wish they can call it God. According to modern theory gravitation, magnetism and electricity are all one force. All matter living or non-living is merely forms of atoms grouped together.

The atom is composed of electrons and protons—positive and negative particles of electricity. It seems that all things are created by the same laws. Cosmos and not chaos rules the world, and cosmos must be controlled. Some force must control it. That force seems to be "mind." Life, if it is a complex chemical compound, could not come from nothing, out of nothing. God has nothing to do with us. We are not images. He is of a higher order of living energy. He is a wave of thought, a wave of energy. God is an electro-magnetic force too powerful to be recorded. In this universe matter does not count—it is mind alone.

Louis Sher,
New York.

(This is too highbrow a discussion for us, so we will leave it entirely to our readers to settle. However, we do wish to be informed when a decision has been reached. We will meanwhile keep our editorial noses down to the grindstone of turning out good stories.—*Editor.*)

(Continued on page 894)

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LIST OF PLATES

Plate I. Nude Adult Female
" II. Nude Adult Male
" III. Nervous System of Female
" IV. Skeletal System
" V Muscular System (Posterior)
" VI. Muscular System (Anterior)
" VII. Vascular System
" VIII Respiratory System
" IX. Digestive System
" X. Male Genital Organs in Detail
" XI. Female Genital Organs in Detail
" XII. Cross Section of Pregnant Female Body with Child.

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Extra Marital Relations, with or Illegitimacy
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Frankness Between Husband and Wife
The Domestic Trio
Love and Sexual Intercourse
Wrong View of Functions and Duties of Love
Sexual Favors
The Double Standard
Unnatural Methods of Love
Definition of Prostitution
Prostitute's Moral Level
Prostitute's Mental Level
Ethics of Prostitution
Does Prostitution Supply a Genuine Need?
Will Prostitution Ever Disappear Entirely?
What Is To Do With the Prostitute
Three Kinds of Prostitutes
Homosexuality, Tribadism, Uranism, and Sadism
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THE READER SPEAKS

(Continued from page 893)

Clarence Darrow Said

Editor, WONDER STORIES:

This is my third letter to your magazine; and you have never published one of them. What's the matter? It makes a reader feel pretty good to see his name in the discussions column.

I see in the March issue another story by Clark Ashton Smith. Boy, there's a writer if there ever was one! You could publish one of his stories every month and it would suit me fine.

When are you going to give us some more stories by Eshbach and Williamson? Say, can't you persuade some of your authors to keep the old God element out of their stories? If there's anything that spoils a story it's that. I don't see how any sane thinking person can believe such trash, anyway. I saw a piece in a Denver paper a few days ago by Clarence Darrow which contained these words, "Gods are born through the minds of ignorant people." There is a smart man who is not afraid to let his thoughts be known.

Well, enough of that. But if anybody wants to argue it out with me he is welcome to it.

I have written thus far without telling you what an excellent publication you have. This is from an admiring reader in the mile-high city of Denver.

Olon G. Wiggins,
Denver, Colo.

(Here is an offer for a ten round bout with Mr. Wiggins. Don't crowd, please. The weapons are typewriters and ten pages. Let's go!—*Editor.*)

The Inseparable Twins

Editor, WONDER STORIES:

Mass and weight are inseparable qualities of matter; the split infinitive still remains to be accepted as correct English; the comma blunder is frowned upon by the best grammarians; and the old nine was small enough.

At present these are the chief complaints I have to make. There have been others, and there will be others, I am afraid; but in my first letter to any science fiction magazine since I first contracted the habit of reading science fiction in 1927, these four points should be the *piece de resistance* of my particular brand of Irish confetti.

In the January, 1933, issue of "The Magazine of Prophetic Fiction," D. D. Sharp prophesies the repeal of one of the main amendments to the Physical Constitution. He presents the unique and hardly tenable view that in mid-space, in a freely moving space vehicle, a body without weight would be without mass.

In this story, if he had wished to be consistent, he might well have pointed out that the circulatory systems of the space travelers would undergo a peculiar change, so that their blood would flow first in one direction and then in the other. The simple truth, however, is that this would not occur—at least so far as our knowledge of physiology lets us state anything positively. And I have failed to find anything in the science publications to suggest that a weightless body such as a hammer, if it struck a man, would fail to make the slightest impression on him.

The physical formula F-Ma, or Force equals mass times acceleration, will give some idea of what I mean. The force exerted by a hammer swinging downward is equal to the mass of the hammer times the sum of two accelerations; that of gravity, and that which is imparted to the hammer by the hand. If the hammer were to swing upward, it would be acting against the acceleration of gravity; so if any force were to be produced, the acceleration of the hand must be greater than that of gravity. The weight of the hammer in both cases, results from the acceleration of gravity times the mass of the hammer.

For a body to have the quality known as weight, it must be near a large body such as a planet, so that the accelerating force of gravity may act upon it. BUT THE MASS NEVER CEASES TO EXIST. That hammer would drive a nail just as far in mid space as it would on the surface of the earth. It is the mass that does the work, not the weight.

So that Mr. Sharp's depiction of a heavy iron stool being as light as tissue paper, with gun-butts and heavy switch levers having no more effect on the enemy than so many feathers, is an unreliable source of scientific information, to say the least. Yet he does, I believe, depict a bullet shot from a gun as killing one of the enemy quite as effectively in mid space as on earth.

Mr. Sharp's peculiar green metal brings up an interesting point for speculation. I forget what mass or density he assigned to it, but say a quart of it weighed a ton. In empty space, where the bottle containing the metal *weighed* nothing, still its mass would be a ton. It would be just as difficult to handle as a full-sized automobile on earth. One person, moving his arm through the customary distance for a cannon-ball pitch, could hardly impart to the jar of liquid any faster motion than the slow, lazy float of a feather. The same formula quoted above would be in effect here, and the force necessary to produce even a slight acceleration, when multiplied by so terrific a mass, would be extremely large. And that slow, lazy float could do as much damage as an automobile coasting at ten miles an hour into an obstruction.

I appreciate Mr. Sharp's attempt to make interesting science fiction, but why can't Wonder Stories stick to the facts of science as we know them? The hypothesis that a body of great weight would lose mass as well as weight in space is too ridiculous . . . simply because we *know* better. One should not take a stand in direct contradiction to the established laws of science, even for the purpose of a story (which, in the case of "The Messenger from Space," would not have been harmed by the omission of this mistake), when so many other things are open to speculation and speculation only.

This form of liberal speculation, it seems to me, will open up new avenues for science, if it is restricted to those things which are unknown. If there is no way of telling how a thing will act under certain conditions, then speculation clears the way for action. Archimedes, Aristotle, Ptolemy, Galileo, Huygens, Brahe, Newton, Faraday, Davy, Bell, Morse, Marconi, Edison, and Einstein, as well as hundreds of other physicists who have built physics and science in general into what it is today, used this principle. But if research has shown what things will do, why fly in the face of established fact?

Point No. 2: It has seemed to me for some time that a little cure would make Wonder Stories as much a magazine of the English language as of world science. Split infinitives and comma splices are all too common, and they tend to spoil the enjoyment of the story at times. Of course, I have reason to know that typographical errors are the meanest type to kill, and I merely make mention of the fact that I have noticed a full quota in W. S.

Point No. 3: Heartless cruelty on the part of the editors is depriving starved thousands of their proper ration of science fiction. People are dying by the hundreds, falling in the streets and kicking up their toes—all because the new 15c size is just 10c too small. Think that one over.

It might be well for me to say, after such an extensive panning as I have given you, that I like science fiction. If I didn't like it, I would have written you before this. I have just accumulated small grudges over a period of years, and this was my opportunity to turn them all loose in one blast. Incidentally, I enjoyed all the stories in the January issue immensely (even including "The Messenger from Space," Mr. Sharp).

In the "Memory of the Atoms" Messrs. Schachner and Locher have created quite an interesting and even plausible bit of fiction. It is plausible because hardly anything is known today about the human brain, and the events of the story might have happened.

"The Synthetic Entity," though a bit stale, yet had some good points. I believe the first story of the type I ever ran across was "The Malignant Entity," by an author whose name I do not recall. There have been innumerable ones since, but this is as good as any, and brings in a few new angles.

"The Last of the Lemurians" was enjoyable. I read it forty-seven times without finding why the title was what it was. You couldn't have got the slugs switched, could you? I have one

THE READER SPEAKS

(Continued from page 894)

criticism to make of it: the wasn't-that-a-funny-dream, ending is weak. It always has been and always will be.

"The Wreck of the Asteroid" by an author who takes his science as she comes and doesn't try to glorify something that doesn't exist, is growing more and more interesting as time passes. An ordinary author would take this story, and in the last installment, discover the "lost race" and so on ad nauseum. I have great confidence in Mr. Manning, and I hope he will just stick to the same sort of thing that made his first interplanetary stuff so good.

As for the cover, Paul is STILL the best. That covers the cover subject, I think.

John O. Rosser,
Dallas, Texas.

(This is a good letter, and we enjoyed reading it. The error attributed to Mr. Sharp was worth making so long as it can draw men like Mr. Rosser from their seclusion and drive them to the verge of—self expression.

We might say that Mr. Manning will probably appear in our pages quite frequently in the future. "The Man Who Awoke" in this issue should be a forerunner of a series of stories, "utopias" Mr. Manning calls them, of the near and distant future. Anyway, thanks, Mr. Rosser, and call soon again.—*Editor.*)

Cartoon Adventures

Editor, WONDER STORIES:

The January issue of Wonder Stories was the worst issue of the magazine yet—except for "The Wreck of the Asteroid" and "The Memory of the Atoms." "The Last of the Lemurians" didn't even hint about Lemurians—except in the name of the story.

"The Synthetic Entity" was based around an old old plot—"Frankenstein's monster" turned bad man. But, at least, it was well written. As for "The Messenger from Space" it ended too abruptly. And, may I ask, what was the message of the messenger from space?

Now I come to the part of the letter I like most. "The Wreck of the Asteroid" was marvelously written. Manning is a genius. Schachner's writing made "The Memory of the Atoms" what it was.

Here's a suggestion. Why not have Paul, your genius with the pen, run an interplanetary cartoon? Say the adventures of Kormal the Martian.

The monthly editorial by Hugo Gernsback was very interesting and profitable—to me at least.

Jack Rather,
Brooklyn, N. Y.

(The cartoon idea has occurred to us, and has been suggested several times. We have it in mind and we are giving it serious thought. If we get a story that lends itself to an animated strip we may do something about it quickly. But we are interested.—*Editor.*)

Mr. Sharp Answers His Critics

Editor, WONDER STORIES:

Please allow me to state through your "Reader Speaks" department that Mr. Allen Latham has probably overlooked a good many conditions which had a bearing upon Grinstead's adventures aboard the asteroid in "The Messenger from Space."

Water from Grinstead's flask certainly would not have exploded into steam, even if the water boiled, any more than water at the boiling point at atmospheric pressure would explode if poured from the tea kettle spout. Reaching the boiling point does not mean explosion of all the liquid. In fact the low temperature upon the asteroid was entirely sufficient to take care of the expansion of the water due to the vacuum. See your table, Mr. Latham.

As to the statement that I have weight and mass hopelessly confused. This might also be clarified by explaining some of the factors involved. When I spoke of "weight" from the revolving ship, I knew that most of your readers were space minded enough to understand I was referring to the inertia toward the hull of the vessel, which was, of course, the effect of centrifugal force. Grinstead needed the inertia or "weight" in himself and his weapons in order to bring "down" a crushing blow upon the heads of the invaders. Where leverage was possible (as I clearly illustrated in my story) a crushing blow was possible, but with Grinstead unable to obtain a toe hold under any part of the smooth floor, this was impossible, Grinstead and his men were weightless and the floor meant nothing at all.

Whether two men floating freely in space could deliver crushing blows to one another involves some highly theoretical factors. I believe they could not. The one trying to deliver a blow would have no leverage and the other no resistance.

Let me illustrate as nearly as I can in the circumstances. A pugilist tries to straight arm his opponent while balanced on roller skates. The force from his arm reacts in his feet. The handicap is increased if the opponent is also on skates for the blow will meet less resistance.

Another illustration. If I bank a car into another parked at the curb and it is against a stone wall the impact is much greater than one not against a wall but with brakes set, which in turn offers less impact than still another car at the crest of a hill on smooth paving and with brakes released.

On the whole until men actually enter space any experimenting to ascertain the true result must deal with that factor "weight" which Mr. Latham dislikes. It is, indeed, so prominent in the equation of ascertaining mass, or the interia of mass, that there is no device with which we may work which is not hampered by the constant relation of weight to mass at the earth's surface. (Altitude makes too small a difference for crude experiments.)

The nearest approach I have made so far is to suspend a steel ball-bearing by a string first over gravity and then over a powerful magnet. The magnet gives, for my purposes, additional "weight" with the mass, of course, unchanged.

My equipment is very poor and I have no way of measuring the impact of my blow except in the crudest manner. The steel ball strengthened by the pull of magnetism cracked a glass tube when the same blow upon the ball suspended over gravitation alone did not crack the tube. My idea was, since I could in no way change the relation of weight to mass at the earth surface sufficient—to prove or disprove my point, I might at least simulate an addition of weight with the mass unchanged. From the results I have calculated that weight does make a difference in the impact, if not in the blow, for there was a greater impact with a greater resistance of the ball though the mass was unchanged.

Probably I was biased in favor of my experiment when I proved that the greater impact must come from greater resistance which may be obtained in one way by added weight. In any case some of your readers better equipped than I, might give some further light on this question and find a more truely scientific answer to this equation by further experiments along this line.

It seems to me Newton's "Third Law of Motion" applies to the case involved. While the inertia is Mass times the Force, the impact must take into consideration the rebound, which in the case of weightless men was such that the slightest push would send one soaring toward the roof. In such a situation it seems to me either the leverage of a toe hold, or the leverage of weight must be given the body delivering the force and the body receiving the blow, if a crushed skull would result.

D. D. Sharp,
Albuquerque, N. M.

(While we do not entirely agree with Mr. Sharp's explanation, he makes a strong rebuttal to his critics. We leave Mr. Sharp in their hands.—*Editor.*)

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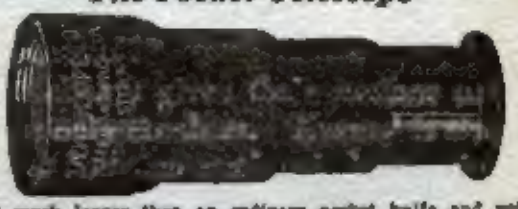

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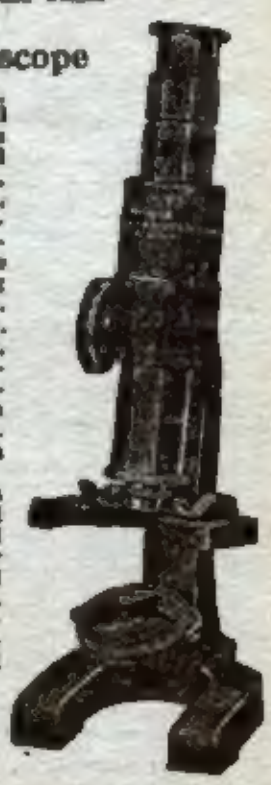

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BOOK REVIEWS

"LIFE IN A TECHNOCRACY." By Harold Loeb. 209 pages. 8 by 5½". Published by The Viking Press, New York. Price, $2.

According to the publishers of this book, Harold Loeb did not write it hastily in order to meet the sudden demand for books on Technocracy, but actually completed it some months before, adding of course those facts which would bring it in line with developments which have recently taken place. The book bears evidence of careful study, explains the principles of the theory of Technocracy thoroughly and clearly, and proceeds to describe what life in a Technocracy would conceivably be like.

He traces the transition of the conception of human values from those of respect for innate values in people, their traditions and ancestors, and their fundamental capacities arising from innate intelligence and worth, to that under the capitalistic system, underlying which is almost solely a belief in monetary values. How man's labor will be assigned, his needs prorated; how his vocations will be decided, according to congenital capacities or inherent tendencies; and the possibilities of the disappearance of crime and disease under such a system; these are some of the phases of life under a Technocratic government which Mr. Loeb treats completely and colorfully.

SURVIVAL OF THE FITTEST by Henry Smith Williams. 317 pages, stiff cloth covers profusely illustrated. Size 6x9. Published by Robert M. McBride, New York. Price $3.50.

Dr. Williams is a great writer of scientific books that cover thinly our vast sciences. In this effort he attempts to cover the question of the rise and development of life on earth, the struggle for existence and finally the rise and supremacy of man. He describes graphically the struggle for existence in the past, the equipment possessed by various forms of life; and the gradual extinction of the unfit.

He goes on then to a discussion of the balance of nature, the fact that if any form of life becomes too dominant the balance is destroyed, and by assisting other forms of life to prey upon the dominant form, nature restores a new balance. Farmers have found to their sorrow, that if they kill off certain pests, others who have been warring upon the pest become more plentiful. And nothing has been gained thereby.

Dr. Williams shows environment and heredity at work today in the struggle for existence, and posing the question, "must all races die?" he answers it in a final chapter on "Human Progress." His conclusion, rather unsatisfactory, is that of the two factors that contribute to progress—the will to live and the opposing environmental handicaps—man has eliminated many of the latter. With the former undiminished his future should be bright.

THE STORY OF SCIENTIFIC PSYCHOLOGY by Adelbert Ford. 300 pages, stiff cloth covers. Size 6x8½. Published by Sears Publishing Co., New York. Price $3.00.

Professor Ford introduces the reader to the history of the development of scientific (and not so scientific) psychology from Aristotle to the present day. He tells of the many workers in the development of our psychological knowledge, their theories, their conquests and failures to understand the nature of the human mind and its operation. Coming up to the present day we are taken behind the scenes of the modern psychological laboratory where we see how the numerous experiments and tests, contrasts to the theorizing of the Greeks, are carried out, and some of the results obtained. What we have finally gained from all of our searching is explained by the author; and he finishes the book with a chapter of "Psychology Facing the Future."

TOURING UTOPIA by Frances Theresa Russell, 316 pages, stiff cloth covers. Size 5x8. Published by Lincoln MacVeagh, the Dial Press, New York. Price $2.50.

Professor Russell has set herself the task of analyzing, explaining, classifying the utopian literature from Plato's "Republic" to Huxley's "Brave New World." Her aim is to examine the writing of men whose imagined worlds newer and better than those they dwelt in, and to see what promises such worlds held for the race.

Her list is quite complete, the bibliography alone containing some 360 names of books of what we to-day might term "science fiction." It is extraordinary the range of fancy, and mental exploration that men have given way to in the ages. From the day that Plato imagined his perfect "Republic," through Thomas More's "Utopia," Swift's "Gulliver's Travels," the satires of Voltaire and Anatole France; the worlds of H. G. Wells down to the utopias written today, we have had almost every possible society and state of human existence pictured.

The book should certainly be read by all collectors of Utopias; and should be equally valuable to the reader and the writer of science fiction.

RELATIVITY AND REALITY by G. H. Paelian, 234 pages, stiff cloth covers, illustrated. Size 5¼x7¾. Published by Macoy Publishing Company. Price $2.00.

Mr. Paelian uses the theory of relativity as a bridge between science and religion. His method is to find in relativity a road to the beyond; and to find in men like Einstein great religious leaders who will restore the faith of the masses in religion.

Certainly Relativity has dealt a great blow to much of the iron-bound scientific dogma. Like Heisenberg's "Uncertainty Principle" it has shown that there is still considerable in our physical universe unknown and even contradictory. That there may be "worlds within worlds" is the belief of the author.

The weakness of all such books is that they reason their way to heaven merely through analogies. They draw cute diagrams of the forces in the universe and theorize their way to their conclusions. Now there is nothing so deceptive in science as an analogy. If men like Mr. Paelian are going to use the scientific method they must carry it through rigorously, not by reasoning, but by scientific demonstration. Even the theory of relativity remained a curiosity until experimental evidence, predicted by Einstein, was found for it.

SCIENCE QUESTIONS AND ANSWERS

(Continued from page 890)

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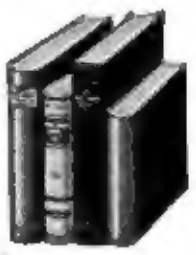

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